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GEORGE HUNTER AND L. BRADLEY PETT

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Determination of Nutritional Status

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STUDIES of nutritional adequacy in Great Britain, in the United States, and in other reasonably prosperous countries have indicated the existence of a considerable amount of malnutrition. The Health Organisation of the League of Nations made a number of studies of nutritional problems and emphasized the widespread occurrence of under-nutrition. This organization urged governmental interest in the subject in every country.

In the fall of 1937 the Dominion Council of Health discussed nutrition and set up a committee of its members, under the chairmanship of Dr. J. G. FitzGerald, to deal with nutritional problems. A scientific advisory committee, with Dr. C. H. Best as chairman, was appointed to furnish expert advice on this subject. Early in 1938 the Department of Pensions and National Health organized a Canadian Council on Nutrition. The membership included a number of persons interested in nutrition and representatives of various agencies and societies. The Nutrition Committee of the Dominion Council of Health together with its Scientific Advisory Committee were constituted as the executive of the Council. Since the inception of this body, Dr. R. E. Wodehouse, Deputy Minister of Pensions and National Health, has been its chairman; Dr. C. A. Morrell, of the same Department, has been secretary.

At the time of the organization of the Council there was a dearth of information regarding Canadian food habits and concerning the nutritive values of Canadian foods. At that time the first large-scale survey of Canadian nutrition was under way in Toronto, under the auspices of a local committee. In the first few months of its existence the executive of the Council drafted a broad program. It was recognized that information regarding actual nutritional deficiencies was needed. Educational work could not be carried out on a sound basis until it was known which mistakes in food habits needed correction. It

was strongly felt that there was a great need for data regarding Canadian foods. Finally, it was thought that much could be accomplished by educational efforts. The Council has been indebted to the Milbank Memorial Fund and to the Government of Canada for funds to carry out these investigations.

It is difficult to discuss the extent of nutritional deficiencies without considering procedures by which they may be determined. The nutritional condition of a person can not be better than the food which he consumes; it can be worse because of a failure to digest, absorb or to utilize foods, or distorted metabolism may impair the nutritive state. Three general procedures have been in use for the determination of nutritional status:

1. Physical examination provides considerable information. It must be remembered that the conclusions drawn from a physical examination are liable to considerable subjective error since they depend upon the judgment of the examiner.

2. A number of laboratory procedures have been used, or suggested, to aid in the diagnosis of deficiency states. These have, generally, the advantage of being free from subjective error and some of them, at least, can be usefully employed in conjunction with a physical examination.

3. Dietary surveys have been extensively used. Much of the recent interest in nutrition has been aroused by the results of these surveys. A general criticism advanced against dietary surveys is that they provide information only about food consumption and the results should not be accepted as a measure of nutritional status. There is considerable justification for this criticism but it should be emphasized that the state of nutrition cannot be better than the food consumed. If an examination of food intake shows a meagre supply of calcium it can be concluded, quite properly, that the individual is likely experiencing a calcium deficiency.

The best procedure for the determination of nutritional status at present available is a combination of various methods: a careful physical examination, a record of food consumption, and the use of such diagnostic tests as seem to be of value. The expense of such an investigation inhibits its general use. Three large-scale surveys following this general plan are now in progress in the United States; none have yet been attempted in Canada.

To secure as much information as possible with available funds, the executive of the Council on Nutrition decided to carry out four dietary surveys, one in each of the following cities: Halifax, Quebec, Toronto, and Edmonton. Preliminary reports are contained in this issue. The surveys have been done on individuals; this has the obvious advantage of making possible comparisons within a family.

From records of food consumption calculations of nutritive values must be made. This involves the use of tables of food composition. A number of such tables are available but information regarding Canadian foods was scanty. It was recognized that results of the different surveys would not be comparable unless a common set of food tables was employed in all calculations. For use in

the surveys a set of food tables was prepared and used in all four centres. Information regarding a number of foods had to be secured by analysis.

Results of calculations of nutritive values become of practical value when they are assessed in terms of a standard of adequacy. A number of dietary standards have been devised. The executive of the Canadian Council on Nutrition was forced to choose a dietary standard so that the records of food consumption collected in the various surveys could be evaluated in terms of nutritional adequacy. A standard which has received wide acceptance is that which was promulgated by the Health Organisation of the League of Nations. Some features of it are not applicable to Canadian conditions. The executive decided to draw up a Canadian standard, based upon the best scientific information. The standard, as it now exists, is incomplete. Requirements for calories, protein, fat, carbohydrate by implication, calcium, and iron are given. Requirements for other minerals and for vitamins are not listed, although provisional standards for three of the vitamins were adopted. The details of the standard are given at the conclusion of this report. The results of the four dietary surveys carried out under the auspices of the Council on Nutrition have been expressed in terms of the Canadian Dietary Standard.

TOTAL CALORIES

Infants—At one month of age	500 calories
At six months of age	800 "
At one year of age	1,000 "

Children—	*Girls*	*Boys*
From the end of 1st year to end of 3rd year	1,250 cals.	1,400 cals.
From the end of 3rd year to end of 6th year	1,650 "	1,900 "
From the end of 6th year to end of 10th year	2,000 "	2,200 "
From the end of 10th year to end of 12th year	2,250 "	2,400 "
From the end of 12th year to end of 15th year	2,500 "	3,200 "
From the end of 15th year to end of 18th year	2,500 "	3,600 "

Adults:

Women—

No manual work	2,000 calories
Housework, or similar	2,400 "
Pregnant, no manual work	2,400 "
Pregnant, with housework	2,800 "
Nursing	3,000 "

Men—

No manual work	2,400 calories
Light manual work	2,800 "
Moderate manual work	3,300 "
Hard manual work	4,200 "
Very hard manual work	5,000 "

PROTEIN

Children—

The protein requirement for children during the first year of life is supplied by 1½ to 2 ounces of milk per pound of body weight.

The protein requirements of older children are given in the following table.

For convenience in calculation, the protein requirements of older children may be computed on the basis that 14 per cent of the total calories should be taken as protein.

Age	Protein* requirements	
	Girls	Boys
	grams	grams
From the end of 1st year to the end of 3rd year	47	53
From the end of 3rd year to the end of 10th year	62	71
From the end of 10th year to the end of 12th year	68	72
From the end of 12th year to the end of 15th year	75	96
From the end of 15th year to the end of 18th year	75	108

*Fifty per cent of the protein should be from animal sources.

Adults—

Although recognizing that approximately one gram of protein per kilogram of body weight per day is an adequate intake, and that 70 grams per day will supply the requirements of the average man and 56 grams per day will supply the requirements of the average woman, nevertheless, dietary custom is such that it is recommended that 12 per cent of the total calories be consumed as protein. One-third of the protein should be from animal sources.

During pregnancy and lactation, the protein requirements of women are increased. The requirements during lactation are about 1¼ to 1½ grams per kilogram of body weight per day, and may be taken as 14 per cent of the total calories.

FAT

Children and Adults—

Not less than 30 per cent of the total calories.

MINERAL ELEMENTS

Calcium:

Children—

Up to 10 years of age ..... 1·0 gm. per day
From the end of 10th year to the end of 18th year ..... 1·25 "

Adults:

Men—

0·6 gram per day.

Women—

0·6 gram per day except during pregnancy and lactation when 1·5 grams per day should be supplied.

Iron:

Men—

10 mg. per day.

Women—

15 mg. per day.

Children—

Up to one year of age ..... 5 mg. per day
From the end of the 1st to the end of the 5th year ..... 10 "
From the end of the 5th to the end of the 18th year ..... 15 "

Iodine:

The general use of iodized salt is recommended. Sea fish are rich in iodine.

VITAMINS

It is recognized that the following vitamin factors have been shown to be necessary for humans: vitamin A, parts of the vitamin B complex (thiamin, riboflavin, and nicotinic acid), vitamin C or asorbic acid, and vitamin D. All of these vitamins must be contained in the diet or supplement, but only in the following instances have quantitative estimates been accepted as reliable.

Ascorbic Acid (Vitamin C):

Infants—

Twenty milligrams per day (one ounce of average orange juice or three ounces of strained factory canned tomatoes, preferably in divided doses).

Older Children and Adults—

Require larger quantities of vitamin C than those recommended for infants.

Vitamin D:

Infants and Children (up to the end of the 18th year)—

500 International Units.

Women—

During pregnancy and lactation mothers should receive 500 International Units of vitamin D daily.

MILK

Milk is a rich source of calcium, phosphorus and a good source of thiamin. Milk fat is an important source of vitamin A. Milk also supplies animal protein, fat and carbohydrate. Since milk is our chief source of calcium, the following consumption is recommended:—

From birth to end of 6 months of age	1½ pints daily	or	852 cc.
From end of 6 months to end of 1st year	1 quart daily	or	1,137 "
From end of 1st year to end of 10th year	1¼ pints daily	or	710 "
From end of 10th year to end of 18th year	1½ pints daily	or	852 "
Adults (except as noted below)	½ pint daily	or	284 "
Pregnant women	1½ pints daily	or	852 "
Nursing mothers	1½ pints daily	or	852 "

(Canadian pint—20 fluid ounces or 568 cc.)

The extra allowance of milk during pregnancy and lactation furnishes the extra calories, protein, and most of the calcium stipulated in other sections of these recommendations. The balance of the calcium could be supplied by the consumption of cheese, and it is recommended that cheese be included in the diet of children over two years of age. Skimmed milk is also a good source of calcium and protein.

For convenience, the requirements outlined in the Canadian Dietary Standard have been summarized in the following table:

DAILY REQUIREMENTS BASED ON THE CANADIAN DIETARY STANDARD

——	Cal.	Fat g	Protein			Ca g	Fe g
			Total g	Anim. g	Plant g		
Infants—							
at 1 month of age	500	17	13	13	.....	1·00	·005
at 6 months of age	800	27	22	22	.....	1·00	·005
at 1 year of age	1,000	33	31	31	.....	1·00	·005
Girls—							
end of 1st to end of 3rd year	1,250	42	47	23	24	1·00	·010
end of 3rd to end of 5th year	1,650	55	62	31	31	1·00	·010
end of 5th to end of 6th year	1,650	55	62	31	31	1·00	·015
end of 6th to end of 10th year	2,000	67	62	31	31	1·00	·015
end of 10th to end of 12th year	2,250	75	68	34	34	1·25	·015
end of 12th to end of 15th year	2,500	83	75	37	38	1·25	·015
end of 15th to end of 18th year	2,500	83	75	37	38	1·25	·015
Boys—							
end of 1st to end of 3rd year	1,400	47	53	26	27	1·00	·010
end of 3rd to end of 5th year	1,900	63	71	35	36	1·00	·010
end of 5th to end of 6th year	1,900	63	71	35	36	1·00	·015
end of 6th to end of 10th year	2,200	73	71	35	36	1·00	·015
end of 10th to end of 12th year	2,400	80	72	36	36	1·25	·015
end of 12th to end of 15th year	3,200	107	96	48	48	1·25	·015
end of 15th to end of 18th year	3,600	120	108	54	54	1·25	·015
Women—							
no manual work	2,000	67	60	20	40	·60	·015
housework, or similar	2,400	80	72	24	48	·60	·015
Men—							
no manual work	2,400	80	72	24	48	·60	·010
light manual work	2,800	93	84	28	56	·60	·010
moderate manual work	3,300	110	99	33	66	·60	·010
hard manual work	4,200	140	105	35	70	·60	·010
very hard manual work	5,000	167	105	35	70	·60	·010

A Dietary Survey in Halifax

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THE importance of dietary adequacy in its relation to public health is taken as axiomatic and generally acknowledged in modern medicine. As part of a plan of the Canadian Council on Nutrition to determine the status of nutrition in the urban population of Canada, Halifax was selected as representative of the Eastern Maritime area. Halifax had a population of about 60,000 when this survey began. It has few large industries but is an important Atlantic port and railway terminus. Prior to the present study nothing was known definitely of the adequacy or inadequacy of the dietary habits of the people of this section. A dietary survey was therefore undertaken simultaneously with others in Quebec, Toronto, and Edmonton. The only scientific information of this character relative to Canadian nutrition is furnished by the dietary survey in Toronto of 100 families with small incomes, averaging $1020 annually and reported on by McHenry in 1939 (1).

Families

The survey in Halifax began in September, 1939, and extended over a period of about nine months. The records from 82 families comprising 385 individuals have provided data of sufficient accuracy for this report. All families were living within the city limits. The range of income of this group of families was between $450 and $1500 per annum, with $1023 as average. This represents an income of $19.68 per week with extremes of $8.65 and $28.82. It has been estimated that this sample of the population may be taken to represent about 60 per cent of Halifax families. The families were selected at random, mainly from the city directory, confining this selection to certain districts; occasionally from the files of family records in the Dalhousie Public Health Clinic; and latterly from those associated with two religious organizations situated in the north end of the city. No families on relief were included in this study. The average Halifax family in this survey contained 4.7 individuals (2.1 adults and 2.6 children), varying from 2 to 10 members as extremes. This figure may be compared with 4.9 determined in September, 1938, in the preliminary household budgetary survey of the Dominion Bureau of Statistics for this particular group in Halifax.

Method of Collecting and Calculating Data

The mothers of families cooperating kept an exact inventory of food purchases and food consumption during the course of one week. Scales were provided. In addition the consumption of each individual in the family was separately recorded in about a third of the Halifax families. Two dietitians supervised the work, making daily calls and analysing the data. About ten per cent of housewives approached refused to cooperate on grounds of the time

required or suspicion of the motive. Illness occasionally invalidated the record, especially in the winter of 1940 when respiratory infections were epidemic in Halifax. Corrections were made for edible and inedible wastage, for the presence of guests, and for absence from meals. Edible or plate wastage was found to be so small as to be negligible in this type of family. Records of age, height, weight and sex of all children were kept. The occupation of the wage earner was also ascertained, and most skilled and unskilled labour is represented in the list. Thus mechanics, carpenters, painters, plumbers, firemen and policemen comprise the former; stevedores, truck drivers, porters and general labourers, the latter.

The data of food consumption were calculated in terms of the recognized nutritive elements,—protein, fat, carbohydrate, calcium, phosphorus, iron, the vitamins and energy value. When no analysis of a food could be found, it was analysed either in the Department of Chemistry of Macdonald College or the Chemical Laboratory of the Toronto Sick Children's Hospital. The figures were then compared with accepted standards for adequate nutrition and in particular the Canadian Dietary Standard of the Council on Nutrition (*vide* McHenry (1) or National Health Review (2)).

Results of the Survey

Let us first consider the results as derived from the family as a whole. It is important to learn not only whether the diet of a family was adequate or deficient but whether there was serious deficiency and what proportion of the families surveyed were to be classified thus. To this end families were classified in three groups according to their diet, (1) good or those equal to or better than the standard, (2) fair or those between 70 and 99 per cent of the standard, (3) poor or those obtaining less than 70 per cent of the standard for one or more constituents. On this basis 8 families (10 per cent) are in class 1, 16 families (20 per cent) in class 2, and 58 families (70 per cent) in class 3. This is based, however, on a consideration of *all* nutritional essentials capable of quantitative expression and the result appears worse than it actually is on closer inspection. Considered on the basis of the *average* consumption of the 82 families, there are only three deficient elements, as can be seen in figure 1. These are calcium (91 per cent), vitamin B_1 (36 per cent) and vitamin C (74 per cent). The most apparent deficiency is thiamine (vitamin B_1), with ascorbic acid (vitamin C) in second place.

From the standpoint of public health, however, the lower part of the average is justly important and it is quite apparent from the tabulated results that very appreciable numbers of the families were under the Canadian Dietary Standard. Thus one-third of the Halifax families were deficient in protein and iron, one-half in calories, phosphorus and vitamin A, and most in calcium and vitamins B_1 and C. If we lower the standard to the 70 per cent level as minimal adequacy the situation is much better. Very few families show appreciable deficiencies except in calcium and the three vitamins, A, B_1 and C. In these elements 40

per cent of families have diets definitely inadequate in calcium, 34 per cent in vitamin A, 57 per cent in C and all in B_1. The deficiency in thiamine (B_1) is the most striking result of the survey in Halifax.

Calories

The average consumption for men was 2622 calories per day. This is slightly under the Canadian standard of 2800. However only 16 per cent were under the 70 per cent minimum. This result is somewhat surprising and might raise the question whether the Maritimer works as hard as the standard allows for muscular effort. The situation as regards women is essentially the same as for men. Only 11 per cent are under the minimum. The average consumption was 1963 calories as against a standard of 2400. The records of the children have been separated into boys and girls of 1 to 18 years. The boys were proportionately somewhat lower than the girls, as is shown in figure 1. It would

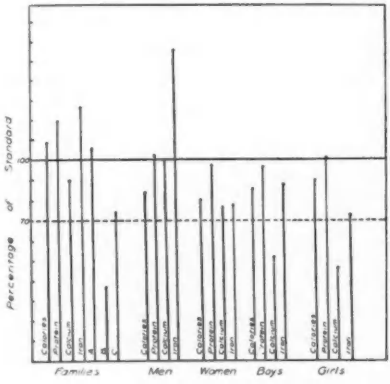

FIGURE 1.

be interesting to test the deficiencies noted against height-weight averages to confirm the relationship of diet to growth. Such cases of undernourishment should be apparent in subnormal bodies.

Protein

The family average is good at a level of 120 per cent of the standard. The adult male consumed 95 grams per day and the adult female, 68 grams. These figures represent 102 and 97 per cent of the standard. The situation was equally good for boys and girls. From inspection of the food lists it may be stated that an adequate amount of this protein was of animal origin.

Fat and Carbohydrate

Of all dietary constituents fat was the most adequate. The records substantiate the opinion previously expressed that in North America we eat propor-

tionately more fat. Thus the average daily figure for men was 120 grams and for women 89 grams. Children did equally well. The average for the family was 148 per cent of the standard. On the other hand the figure for total carbohydrate was small,—for men, 274 grams, and for women 207 grams.

Calcium and Phosphorus

These important elements, especially for children, are frequently deficient. Although the general family averages showed 91 per cent of the standard for calcium and 108 for phosphorus, a large proportion (40 per cent) of the families surveyed was under the minimum standard for calcium. The explanation for this lies in the inadequate consumption of calcium by the children. On the basis of individual analysis of the diets it is apparent that the men fared adequately at 99 per cent of the standard and the women moderately at 77 per cent. A third of the women were under the minimum standard. It is, however, in the children that major deficiencies are apparent. The boys were consuming an average of only 51 per cent and the girls, 45 per cent of the standard. Still worse, 88 per cent of the boys and 91 per cent of the girls were under the minimum. This is an important finding of the survey. It is substantiated by a calculation of the average consumption of milk in the whole group. This figure was 7.14 quarts per family or 1.52 quarts per caput per week.

Iron

The figures for the consumption of iron are of interest in the light of the greater requirements of women and children than men, viz., 15 and 10 milligrams per day respectively. Not a single man was under the level of 70 per cent of the standard and only a few under the standard itself. The average consumption of the women was 12 milligrams but a large proportion (44 per cent) were taking inadequate amounts daily. This was also notable in the case of the girls. The common practice of using molasses is to be commended as it supplied the group under survey with much of its iron.

Vitamins

These dietary substances present the most difficult results of the survey from which to draw sound conclusions. Methods of assay are open to large errors and human requirements are still uncertain. These facts must be kept in mind in reviewing the results obtained. The daily adult requirements have been tentatively accepted as A, 6000 I.U.; B_1, 500 I.U.; and C, 1200 I.U., with a lower scale for children. The consumption ***per caput*** was A, 4989 I.U.; B_1, 210 I.U.; and C, 711 I.U. for all individuals. Even if the standard of comparison is lowered to 70 per cent, at this level 34 per cent of families were deficient in A, 100 per cent in B_1 and 57 per cent in C. The children in this respect were faring better than the adults. This result may mean a serious deficiency in the Maritime food consumption or it may mean a standard that is too high. It is of interest, however, to draw attention to the recent action in Great Britain of reinforcing flour with calcium and vitamin B_1, accepting the adult daily requirement as identical

with the value given above (Moran and Drummond, 3). Perhaps our policy with respect to degree of milling should be revised to incorporate more of the whole grain and hence more thiamine (B_1). The supply of vitamin A was largely due to consumption of carrots, tomatoes and dairy products. More than half of the adults were under the minimum standard. The supply of B_1 came largely from bread, milk, and potatoes. The intake for men averaged 177 I.U. per day and for women 128 I.U. as against a standard of 500 I.U. The supply of C was provided largely from citrus fruits, especially oranges, and potatoes. The level of intake for adults, however, was not high, although 76 per cent of all families were buying fresh fruit.

The Food Budget

Most Halifax families in this survey were spending between 30 and 60 per cent of their incomes for food. The average weekly food expenditure was $9.46 per family or $2.21 per caput. The extremes were $0.86 to $4.42 per person. Food costs in Halifax are relatively much higher than in Toronto or Edmonton. This fact must be considered carefully in making comparisons. On the basis of the classification of families into three classes given at the beginning of this paper it is possible to arrive at an approximate cost of an adequate diet. Class 1 spent on the average $3.38 per person; class 2, $2.76; class 3, $1.10. It would therefore seem reasonable to set $3.00 as an approximation of the amount necessary to purchase an adequate ration weekly per person. One of the records showed that it could be done for $2.18, but this was exceptional.

Summary

A dietary survey comprising 82 families and 385 individuals has been carried out in Halifax by both inventory and individual methods in the income range of $450-$1500 per annum. The results in terms of nutritional essentials have been compared with the Canadian Dietary Standard. The most important findings were a deplorable deficiency in the intake of calcium by the children and of the vitamins, especially B_1, by the whole group.

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Enquête sur l'Alimentation Habituelle des Familles de Petits-Salariés dans la Ville de Québec

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Notes Préliminaires
par HONORÉ NADEAU, M.D.

AU cours de ces dernières années, les divers problèmes que pose l'alimentation rationnelle, des individus sains et des collectivités, ont été l'objet d'une attention toute spéciale de la part de différents milieux scientifiques ou autres particulièrement intéressés au maintien de la santé publique. Sous l'impulsion de nombreux chercheurs, la science de l'alimentation a fait des progrès incessants. De plus en plus on se rend compte, dans tous les milieux, du rôle primordial que joue l'alimentation bien comprise dans le développement, le comportement et le rendement des individus et des collectivités. Les recherches poursuivies jusqu'à date dans ce domaine ont mis pleinement en lumière les nombreux avantages de l'alimentation rationnelle, équilibrée et suffisante. Par ailleurs, on s'est ému devant les funestes effets d'une alimentation déficiente et de fautes invétérées d'hygiène alimentaire.

L'intérêt du grand public a été mis en éveil par des campagnes menées à cette fin, et de plus en plus l'on se convainc dans tous les milieux que, comme l'a dit le Professeur Mouriquand: "la saine diététique est pour l'homme la plus utile des sciences: correcte, elle lui assure (sauf agressions pathogènes) une vie et une descendance normale; défectueuse, elle entraîne des troubles à échéance proche ou lointaine qui compromettent ou ruinent sa santé."

Au Canada, ces divers problèmes de l'alimentation ont reçu toute l'attention qu'ils méritaient par leur importance. Un organisme central, créé sous les auspices du Ministère Fédéral de la Santé Publique, le Conseil Canadien de la Nutrition, a entrepris dans ce domaine de nombreux travaux dont les résultats se sont déjà montrés d'une haute portée pratique. En tenant compte des diverses conditions de vie dans les différentes classes de la Société, on a établi pour le Canada des standards, des normes alimentaires, pouvant satisfaire les besoins nutritifs de tout individu ou de tout groupe d'individus

dans quelque condition où il puisse se trouver. Ces bases ayant été bien établies, il importait en second lieu de s'enquérir de la composition de l'alimentation habituelle dans les diverses collectivités, afin d'en bien connaître la valeur intrinsèque et d'en noter les déficiences et être ainsi en mesure d'y remédier. Ce travail a déjà été accompli dans diverses provinces du Dominion et a fourni des renseignements du plus haut intérêt.

En 1939, le Conseil Canadien de la Nutrition désirait la tenue d'une enquête sur l'alimentation dans la ville de Québec et nous confiait le soin de mener ce travail à bonne fin.

Cette enquête a porté sur un total de soixante et seize familles, recrutées dans la classe des "gagne-petit" et appartenant à des professions très diverses. (Revenu de moins de $1,500.00 par année). Au cours de ces recherches, il a été tenu compte de l'âge, du sexe, des conditions physiologiques, du poids, de la taille, du genre de travail, du revenu annuel du chef ou de tout autre membre de la famille en observation. Des garde-malades diététitiennes se sont rendues au domicile de chaque famille pour y recueillir les renseignements nécessaires.

Dans chaque famille en particulier, on a noté aussi exactement que possible le coût, la nature et la variété des aliments consommés au cours de la semaine d'observation. Pour chaque individu on a recueilli avec précision la quantité de chaque aliment consommé au cours de la semaine. Ce travail préliminaire a été assez long et parfois bien ardu et nous offrons nos plus vifs remerciements à Mlle D. Létourneau G.M.G., et à Madame G. Lortie, G.M.G., pour avoir bien voulu se charger de cette tâche et de l'avoir accomplie avec tant de tact et de précision. De même, nous voulons exprimer toute notre reconnaissance aux nombreuses familles qui se sont prêtées avec tant de bienveillance à nos investigations.

Le travail subséquent a consisté à faire le calcul, pour la famille entière et pour chaque sujet en particulier, du nombre de calories, de la quantité de protéines, de graisses, d'hydrates de carbone, de calcium, de phosphore, de fer, de vitamines "A", "B_1", et "C", fournis par les aliments consommés au cours de la semaine d'observation. Ce travail a été grandement facilité grâce à la collaboration de Mlle. A. Drolet, G.M.G., et Mlle. L. Legendre, G.M.G., que nous remercions vivement.

ÉTUDE DES DONNÉES DE L'ENQUÊTE

PAR J. E. SYLVESTRE, M.D.

EN étudiant les données de cette enquête, nous considérerons les uns après les autres les principaux éléments, dont il faut surveiller la présence dans toute alimentation, si on veut satisfaire les besoins du corps humain. Ces substances sont celles dont nous constatons bien souvent des signes d'insuffisance: les protéines, le calcium et le fer, ainsi que les vitamines. Nous parlerons également de la somme des calories fournies par les protéines, les graisses et les hydrates de carbone contenus dans les aliments consommés, parce que nous en avons besoin de ces calories pour conserver notre chaleur animale,

maintenir ou augmenter notre poids et fournir l'énergie nécessaire aux activités vitales de l'organisme, l'exercice et le travail.

Le Conseil Canadien de la Nutrition a établi un étalon de ration alimentaire, pour chacun de ces éléments essentiels. Les quantités déterminées sont proposées comme termes de comparaison, pour apprécier jusqu'à quel point l'alimentation d'un individu répond aux besoins de son organisme. Nous exprimerons donc la valeur des régimes alimentaires des personnes comprises dans cette enquête, par la proportion de chacune de ces substances fournies par les aliments consommés, en rapport avec les quantités déterminées par le Conseil Canadien de la Nutrition.

Tout de même, avant d'entreprendre cet exposé des faits, il est bon de donner quelques détails sur le groupe compris dans cette enquête. Soixante et seize familles y ont pris part. Elles étaient constituées de 391 personnes, dont 188 adultes (87 du sexe masculin et 101 du sexe féminin) et 203 enfants que nous subdiviserons en 2 groupes d'âges distincts:—

1o: 11 à 18 ans inclusivement (en tout 51 dont 26 garçons et 25 filles)

2o: moins de 11 ans (en tout 152, répartis également dans les deux sexes).

Le revenu annuel de ces familles ne dépasse pas $1,500.00; l'échelle des revenus hebdomadaires par famille s'étend de $11.54 à 28.85, la moyenne étant de $21.44, avec répartition à peu près égale au-dessus et au-dessous de cette moyenne. Le nombre de personnes varie considérablement avec les familles et souvent même parmi les familles ayant un revenu familial identique, c'est pourquoi il est plus juste de considérer le revenu familial par personne; considérant le revenu hebdomadaire par personne, le moindre est de $2.10 et le plus élevé est de $9.61, avec une seule exception de $13.46, la moyenne étant de $4.80. La répartition des familles au-dessus et au-dessous de cette moyenne cette fois n'est pas égale, 44 familles ayant un gain hebdomadaire, par personne, inférieur à ce montant.

Ceci étant dit, nous passons à l'étude proprement dite des données de l'enquête. Pour plus de brièveté et de clarté dans l'exposé, nous avons cru bon de classer l'efficacité des régimes alimentaires suivant 3 degrés.

1o: Au sommet, niveau supérieur, indice d'une ration suffisante, ont été classées toutes personnes dont l'alimentation contient, pour une substance donnée, une quantité égale ou supérieure (100 pour cent ou plus) à celle déterminée comme standard canadien.

2o: Niveau moyen, ration insuffisante, lorsque l'alimentation sans fournir 100 pour cent d'une substance donnée, procure au moins 70 pour cent de la quantité déterminée comme standard canadien.

3o: Au bas de l'échelle, niveau inférieur, indice d'une ration déficiente ont été groupées toutes les personnes dont l'alimentation ne contient même pas, pour une substance donnée, 70 pour cent de la quantité établie comme standard canadien.

Calories Totales

Par ce terme "calories totales", nous désignons la valeur calorique totale des protéines, des graisses et des hydrates de carbone contenues dans les aliments consommés.

L'ensemble des familles nous donne une consommation moyenne de 103.4 pour cent. Tout de même, si nous les considérons séparément, nous n'avons plus que 58 pour cent des familles ayant une ration suffisante, alors que 41 pour cent tombent au niveau moyen, une seule famille n'obtient même pas 70 pour cent des calories jugées nécessaires. Passant aux différents groupes d'âge et de sexe, le tableau général ne varie pas considérablement pour les groupes pris dans leur entier. Les femmes adultes et les grandes filles ont une consommation moyenne de 96 pour cent et les grands garçons 91.7 pour cent; les enfants ayant moins de 11 ans ont une moyenne de 110.2 pour les garçons et 116.1 pour les filles. Quand on prend les individus séparément, certains détails sont assez significatifs. Les adultes masculins tiennent la tête et une proportion de 57.5 pour cent des leurs se groupent au sommet, tandis que les autres se retrouvent tous au niveau moyen. Il y a peu de différence chez les femmes, celles-ci comptant 42.6 pour cent des leurs au sommet, 53.5 pour cent au deuxième palier et 3.9 pour cent au bas de l'échelle.

Les deux groupes d'enfants présentent entre eux des caractéristiques assez marquées. Parmi ceux de 11 à 18 ans, il n'y a que 34.6 pour cent des garçons et 40 pour cent des filles qui aient 100 pour cent et plus des calories nécessaires; 50 pour cent des garçons et 56 pour cent des filles entrent dans la marge moyenne, ce qui fait que, chez les garçons, 15.4 pour cent n'ont même pas 70 pour cent des calories désirables. Chez les jeunes c'est bien différent, car les deux tiers, tant chez les garçons que chez les filles, reçoivent 100 pour cent et plus des calories nécessaires, tandis que l'autre tiers se retrouve presque en entier dans la marge de 70 pour cent à 99 pour cent.

Les protéines

L'ensemble des familles reçoit en moyenne, des aliments consommés, une proportion de 107.1 pour cent des quantités de protéines fixées par le Conseil Canadien, et la répartition est la même que pour les calories. Quant aux groupes pris séparément, les adultes ont une consommation moyenne de 113.3 pour cent (les femmes 106 pour cent et les hommes 120 pour cent). Les enfants de moins de 11 ans ont une consommation moyenne satisfaisante, mais encore ici, le groupe de 11 à 18 ans n'atteint pas 100 pour cent de ses besoins normaux en protéines, les garçons ayant une moyenne de 89.7 pour cent et les filles 97.5 pour cent. Bien que le groupe des jeunes, pris dans son entier, ait une consommation moyenne suffisante, quand on prend tous les enfants individuellement, les grands comme les petits sont peu nombreux au sommet. C'est tout de même chez les grands garçons que la situation est la pire. Chez eux 27 pour cent seulement ont une ration de protéines suffisante et même on en retrouve 19.2 pour cent au bas de l'échelle, ayant une consommation déficiente. Les grandes filles sont un peu mieux partagées; nous en avons 40 pour cent au niveau supérieur et 8 pour cent seulement au niveau inférieur, 52 pour cent étant au niveau moyen. Chez les jeunes aussi la proportion des enfants dont le besoin en protéines est satisfait se trouve plutôt limitée, étant de 39.5 pour cent pour les garçons et 46 pour cent pour les filles. Dans ce groupe on trouve encore une proportion assez importante d'enfants dont l'alimentation est

déficitaire en protéines: 13.1 pour cent chez les garçons et 14.5 pour cent chez les filles. Quant aux adultes, les hommes excellent avec une proportion de 81.6 pour cent du groupe recevant 100 pour cent et plus des protéines jugées nécessaires, tandis que les femmes n'ont que 58.4 pour cent de leur groupe pourvues d'une aussi bonne ration, 5 pour cent seulement d'entre elles n'ont pas 70 per cent, et des hommes il n'en est aucun. Les protéines servent à la formation et à la réparation des cellules. Il est donc important que l'adulte en ait suffisamment pour maintenir l'intégrité de ses tissus, l'enfant pour croître normalement, la femme enceinte pour la croissance du foetus et la nourrice pour une secrétion abondante du lait.

Le calcium

Aucun des groupes ne prend une alimentation qui lui fournisse suffisamment de calcium, et les moins bien nourris en cette substance sont encore les enfants de 11 à 18 ans, précisément ceux dont les besoins de croissance exigent des quantités plus grandes.

Les hommes ont une consommation moyenne de 98.2 pour cent, mais 17.3 pour cent n'ont pas 70 pour cent de la quantité standard et 42.5 pour cent d'entre eux, quoique recevant plus que 70 pour cent, n'atteignent pas le terme de 100 pour cent. Les femmes avec une consommation moyenne de 85.3 pour cent seulement comptent par conséquent très peu des leurs parmi celles dont les besoins en calcium sont satisfaits. En effet, il n'en est que 28.7 pour cent qui aient une quantité suffisante de calcium, tandis que 29.7 pour cent ont une consommation tout à fait déficiente.

Les enfants de 11 à 18 ans consomment en moyenne les proportions suivantes: Les garçons 49.3 pour cent et les filles 41.2 pour cent. Dans l'un comme dans l'autre sexe, il n'en est pas un seul qui consomme une quantité de calcium égale à la quantité désirable, bien plus, 84.6 pour cent des garçons et 92 pour cent des filles n'ont même pas 70 pour cent de la quantité jugée nécessaire.

Les conditions sont un peu moins désavantageuses pour les moins de 11 ans, tant chez les garçons que chez les filles, leur consommation moyenne respective étant de 66.5 pour cent et 70.2 pour cent. Tout de même, nous avons encore ici 60.5 pour cent des garçons et 56.6 pour cent des filles dont la part en calcium n'atteint pas 70 pour cent de la quantité désirable. Cependant ce qui est mieux que chez les plus âgés, 14.5 pour cent des garcons et 11.8 pour cent des filles reçoivent une ration suffisante.

Le calcium étant indispensable à la formation des os et des dents, ainsi qu'à leur conservation, une déficience aussi générale que celle qui nous est démontrée ici peut servir assez souvent d'explication au mauvais état du squelette et des dents que l'on rencontre chez un si grand nombre d'enfants et même d'adultes.

Chez les enfants jusqu'à l'âge de 18 ans, il est à peu près impossible de leur fournir assez de chaux pour répondre à leurs besoins sans inclure une certaine quantité de lait dans leur alimentation: 20 onces pour les jeunes et 30 onces pour les plus âgés. Ces quantités peuvent être remplacées, en partie du moins, par du fromage, à raison de 1 once de fromage pour 8 onces de lait.

Consommation du lait.
Exclusion faite du lait utilisé dans la cuisson des aliments.

87 hommes,	moyenne par jour	0.32	chopine
101 femmes,	moyenne par jour	0.34	chopine
51 enfants de 11 à 18 ans,	moyenne par jour	0.36	chopine
152 enfants de moins de 11 ans,	moyenne par jour	0.65	chopine

La consommation insuffisante de lait ou de fromage est ici la raison principale pour laquelle les enfants accusent un déficit aussi considérable en calcium. Pour un bon nombre des familles nombreuses, on n'a pas les moyens d'acheter assez de lait. On pourrait tout de même consommer plus de fromage: 20 onces étant la quantité totale consommée durant une semaine par les 76 familles. Le fromage est une source de calcium, moins dispendieuse que le lait. Il fournit aussi des protéines excellentes qui se comparent avantageusement avec celles de la viande. Du même coup, on réduirait la dépense qu'il faudrait raisonnablement faire pour le lait ainsi que la dépense parfois excessive que l'on fait pour la viande.

Le fer

Le fer est aussi un élément dont l'alimentation n'est pas suffisamment pourvue, et pourtant le fer est indispensable à la régénération normale des globules rouges. Généralement les hommes n'en manquent pas. Ici, nos hommes ont une consommation moyenne de 177 pour cent de la quantité désirable et 95.4 pour cent d'entre eux ont un régime alimentaire susceptible de leur fournir 100 pour cent et plus de leur besoin en fer. Il n'en est pas de même pour les femmes dont les besoins physiologiques sont moitié plus grands. Chez elles la moyenne de consommation est de 92.7 pour cent, proportion qui à première vue est assez bonne, mais il n'en est que 42.6 pour cent qui aient la quantité désirable tandis que 16.8 pour cent n'en ont même pas 70 pour cent, laissant une proportion de 40.6 pour cent du groupe au niveau moyen de consommation. Chez les enfants, les garçons de 11 à 18 ans figurent mieux que les 3 autres groupes. Leur consommation moyenne est de 107.7 pour cent de la quantité jugée nécessaire, avec une proportion de 7.7 pour cent seulement de leur groupe n'ayant pas 70 pour cent de la consommation désirable; 57.7 pour cent se classent au sommet. Mais chez les grandes filles de même que chez les enfants plus jeunes des deux sexes, l'approvisionnement n'est pas aussi bien proportionné aux besoins. Les grandes filles ont une consommation moyenne de 82.6 pour cent et les jeunes de 89.8 pour cent. Chez les grandes 20 pour cent seulement ont une ration suffisante, et chez les petites 29 pour cent. On trouve une proportion de 32 pour cent chez les grandes et 34.2 pour cent chez les petites, dont l'alimentation ne fournit même pas 70 pour cent de la quantité standard. Les petits garçons font un écart un peu moins considérable, mais leur condition n'est guère plus avantageuse. Leur consommation moyenne est de 90.1 pour cent des quantités de fer proposées comme standard; 29 pour cent d'entre eux ont une ration de fer déficiente et 32.9 pour cent seulement reçoivent la quantité désirable. Il est évident que le sexe féminin de

tout âge manque de fer de même que nos jeunes garçons, il n'est donc pas surprenant qu'une grande proportion d'enfants, de jeunes filles et de femmes souffrent d'anémie.

Les vitamines

Bien qu'il soit reconnu que 6 vitamines au moins sont nécessaires à la croissance et au bien-être, —vitamine "A", thiamine (B_1), riboflavine (B_2 ou G), acide nicotinique (PP), acide ascorbique (C) et vitamine "D",—nous ne considérons ici que les vitamines "A", "B_1", et "C".

Les jeunes enfants sont assez bien pourvus de vitamine "A" puisque 65.1 pour cent des moins de 11 ans reçoivent dans leur alimentation une ration suffisante de cette vitamine. Chez les enfants du groupe de 11 à 18 ans, les proportions sont renversées; nous avons 68.7 pour cent des enfants de ce groupe dont la ration est tout à fait déficiente. Passant aux adultes, les conditions sont encore pires; 74.7 pour cent des hommes et 88.1 pour cent des femmes ne trouvent même pas, dans les aliments qu'ils consomment, 70 pour cent de la quantité désirable.

Pour la vitamine "B_1", c'est un désastre général. Dans tous les groupes, seuls les hommes atteignent une consommation moyenne de 83.2 pour cent de la quantité standard, celle des autres groupes ne dépassant pas 70 pour cent. Si nous considérons les individus de chaque groupe et les plaçons au niveau de consommation qui leur convient, nous obtenons les données suivantes: Au sommet de l'échelle sont groupés: 24.1 pour cent des hommes, chez les femmes 4 pour cent, les grandes filles 4 pour cent et les fillettes 7.9 pour cent, les grands garçons 11.5 pour cent et les jeunes 11.9 pour cent. Jetons un coup d'oeil sur l'agglomération des individus groupés au bas de l'échelle; nous y voyons les proportions suivantes: les hommes 39.1 pour cent, ce n'est pas trop mal, mais les femmes s'y trouvent en proportion de 57.4 pour cent, les grandes filles 76 pour cent et les fillettes 82.9 pour cent, les grands garçons 57.7 pour cent et les moins de 11 ans 69.7 pour cent.

Quant à la vitamine "C", nos gens n'en sont pas aussi dépourvus qu'ils le sont des vitamines "A" et "B_1". Ici, les grands garçons tiennent la tête, avec une consommation moyenne de 159.7 pour cent de la quantité désirable et 88.5 pour cent des leurs en reçoivent 100 pour cent et plus en proportion de leurs besoins déterminés par les standards canadiens; les grandes filles viennent ensuite avec les enfants de moins de 11 ans. Pour ces 3 groupes, 60 pour cent ont une consommation suffisante, tout de même, une proportion de 15.8 pour cent des petites filles et de 17.1 pour cent des petits garçons doivent être considérés comme ayant une ration déficitaire en vitamine "C". Chez les adultes, les conditions sont moins bonnes; 21.8 pour cent des hommes et 26.7 pour cent des femmes n'ont pas, dans leur alimentation, 70 pour cent de la vitamine "C" désirable.

Conclusions sommaires

Il est évident que l'alimentation des individus compris dans cette enquête pêche gravement et n'est pas propre à favoriser des conditions physiques

idéales et une santé parfaite. Même, en certains éléments, le déficit est tellement grand que, s'il persiste, la santé sera compromise si elle ne l'est pas déjà. Il ne faut pas cependant croire que de semblables erreurs alimentaires ne se rencontrent que chez nous. Au contraire, et c'est précisément pour cette raison que bon nombre de pays ont étudié le problème et en cherchent des solutions pratiques.

Dans presque tous les rapports d'enquête, on donne comme raison d'un tel état de choses, l'impossibilité économique, pour les petits salariés et les familles nombreuses, d'acheter les aliments nécessaires. Les 76 familles que nous avons vues dépensent en moyenne par semaine $1.80 par personne pour la nourriture, mais 47 familles dépensent moins que cette moyenne; il en est même qui ne dépensent pas plus que $0.85 par personne. Ce n'est certes pas assez. Tout de même, si nous calculons la proportion des dépenses pour toute nourriture par famille, en rapport avec le revenu familial de chacune d'elles, nous obtenons une proportion moyenne de 40.3 pour cent du revenu familial payé pour la nourriture. C'est déjà une proportion assez importante, si on tient compte des autres dépenses inhérentes à la tenue d'un foyer.

Une deuxième raison pour laquelle l'alimentation est déficitaire, c'est le manque de connaissances suffisantes en cette matière. On n'est pas assez au courant de la valeur nutritive des aliments, ni des besoins physiologiques du corps humain, c'est pourquoi on ne sait pas choisir les différentes catégories d'aliments en proportion voulue. Très souvent, pour une somme égale, on pourrait se procurer une alimentation adéquate. Il est donc de première importance que le public soit mis au courant des notions fondamentales se rapportant à ces sujets, afin d'améliorer dans toute la mesure du possible le sort des sous-alimentés qui le sont uniquement par ignorance des faits.

Il en était de même autrefois pour nos taux élevés de mortalité infantile. On donnait comme raison explicative de cette calamité, le grand nombre d'enfants dans nos familles canadiennes, la pauvreté, l'ignorance des principes d'hygiène. Il n'y a pas eu grand changement en rapport avec les deux premiers chefs de cette argumentation, mais depuis quelques années, l'enseignement de l'hygiène s'est infiltré dans presque toutes les classes de la société et les taux de mortalité ont baissé considérablement.

Quand il s'agit de santé public et de bien-être social, il n'est pas suffisant de diminuer le nombre des décès, il faut tout faire pour assurer au plus grand nombre des survivants la santé et le bien-être, dans le sens le plus étendu de ce mot. La santé, c'est un terme positif et non pas une simple négation, excluant les maladies qui vous clouent au lit, ou les troubles qui diminuent de moitié les capacités individuelles. De tels résultats sont impossibles sans une alimentation rationnelle et balancée. Si nous avons obtenu des victoires marquées sur les taux de mortalité infantile, en combattant l'ignorance, servons-nous donc des mêmes armes pour lutter contre le même ennemi sur le terrain de la nutrition et nous obtiendrons, j'en suis convaincu, des résultats pour le moins aussi heureux.

Cet exposé est un rapport préliminaire. Beaucoup d'autres renseignements peuvent être tirés de cette enquête, nous aurons sans doute l'occasion d'y revenir plus tard.

CONSOMMATION MOYENNE

ET

DISTRIBUTION PROPORTIONNELLE DES INDIVIDUS
EN RELATION DE LEUR CONSOMMATION
COMPARÉE AU STANDARD CANADIEN

PROPORTION DE LA CONSOMMATION	FAMILLES	ADULTES		ENFANTS			
				11 à 18 ans		Moins de 11 ans	
		M	F	M	F	M	F
CALORIES							
Consommation moyenne.....	103.4	105.8	96.6	91.7	95.6	110.2	116.1
100% et plus.....	58.0	57.5	42.6	34.6	40.0	65.8	64.5
70% à 99%.....	41.0	42.5	53.5	50.0	56.0	30.3	32.9
Moins que 70%.....	1.0	0.0	3.9	15.4	4.0	4.0	2.6
PROTÉINES							
Consommation moyenne.....	107.1	120.6	106.0	89.7	97.5	100.6	103.9
100% et plus.....	58.0	81.6	58.4	27.0	40.0	39.5	46.0
70% à 99%.....	41.0	18.4	36.6	53.8	52.0	47.4	39.5
Moins que 70%.....	1.0	0.0	5.0	19.2	8.0	13.1	14.5
CALCIUM							
Consommation moyene.....	76.0	98.2	85.3	49.3	41.2	66.5	70.2
100% et plus.....	17.0	40.2	28.7	0.0	0.0	14.5	11.8
70% à 99%.....	37.0	42.5	41.6	15.4	8.0	25.0	31.6
Moins que 70%.....	46.0	17.3	29.7	84.6	92.0	60.5	56.6
FER							
Consommation moyenne.....	112.1	177.0	92.7	107.7	82.6	90.1	89.8
100% et plus.....	62.0	95.4	42.6	57.7	20.0	32.9	29.0
70% à 99%.....	30.0	3.4	40.6	34.6	48.0	38.1	36.8
Moins que 70%.....	8.0	1.2	16.8	7.7	32.0	29.0	34.2
VITAMINE "A"							
Consommation moyenne.....	67.8	57.9	49.1	61.6	60.0	132.6	139.4
100% et plus.....	12.0	4.6	3.0	7.7	12.0	67.1	63.1
77% à 99%.....	25.0	20.7	8.9	26.9	16.0	30.3	30.3
Moins que 70%.....	63.0	74.7	88.1	65.4	72.0	2.6	6.6
VITAMINE "B_1"							
Consommation moyenne.....	66.8	83.2	69.4	67.8	58.7	69.5	64.4
100% et plus.....	7.0	24.1	4.0	11.5	4.0	11.9	7.9
70% à 99%.....	33.0	36.8	38.6	30.8	20.0	18.4	9.2
Moins que 70%.....	60.0	39.1	57.4	57.7	76.0	69.7	82.9
VITAMINE "C"							
Consommation moyenne.....	110.8	102.8	95.6	159.7	123.0	118.4	110.8
100% et plus.....	53.0	46.0	38.6	88.5	60.0	60.5	59.2
70% à 99%.....	34.0	32.2	34.7	3.8	32.0	22.4	25.0
Moins que 70%.....	13.0	21.8	26.7	7.7	8.0	17.1	15.8

SUMMARY OF REPORT ON QUEBEC DIETARY SURVEY

A DIETARY survey has been carried out in Quebec City, by the individual method, on 76 families comprised of 391 individuals (188 adults and 203 children). The yearly income per family was below $1500. The average weekly income per family was $21.44, with extremes of $11.54 and $28.85. The weekly income per person ranged from $2.10 to $9.61, with the average at $4.80. The average food expenditure per person per week was $1.80. Forty-

seven families spent less than this average. Forty per cent of the average family income was spent on food.

The caloric and protein intake was satisfactory. The calcium intake was very low. The teen-age children had the lowest calcium intake, the boys in this group having an average intake of 49.3 per cent of the standard, and the girls 41.2 per cent; 84.6 per cent of the boys and 92 per cent of the girls had intakes below 70 per cent of the standard for calcium. The men and women had an average calcium intake of 98.2 per cent and 85.3 per cent of the standard respectively; 17.3 per cent of the men and 29.7 per cent of the women were below 70 per cent of the standard. The average intake of the younger boys was 66.5 per cent of the standard, with 60.5 per cent below 70 per cent of the standard. The girls in this age group had an average calcium intake of 70.2 per cent of the standard, with 56.6 per cent below 70 per cent of the standard. These observations are supported by the low milk and cheese consumption. The women, teen-age girls, and the children under eleven years were not receiving sufficient iron. Thirty-two per cent of these individuals had iron intakes below 70 per cent of the standard. Only the younger children received a satisfactory intake of vitamin A. Sixty-nine per cent of the older children, 74.7 per cent of the men and 88.1 per cent of the women were below the 70 per cent standard. The intake of vitamin B_1 was definitely inadequate. The men consumed on the average 83.2 per cent of the standard; all other individuals had an average intake below 70 per cent of the standard. The vitamin C intake was more satisfactory.

Low income, the large number of individuals per family, and lack of knowledge concerning food values have been given as reasons for the inadequate food intake. The high infant mortality rate in Quebce has been lowered through educational effort; the authors feel that education along nutritional lines would have a similarly beneficial effect.

A Dietary Investigation in Toronto Families Having Annual Incomes between $1,500-$2,400

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TO-DAY the science of nutrition is playing an increasingly important role in public health. It is recognized that a nation's health can be improved by the practical application of the laws of nutrition. The place which nutrition shares in preventive medicine in promoting health is very nicely summarized by McLester in his presidential address to the American Medical Association in 1935 (1):

> "In the past, science has conferred on those peoples who availed themselves of the newer knowledge of infectious diseases, better health and a greater average length of life. In the future, it promises to those races who will take advantage of the newer knowledge of nutrition, a larger stature, greater vigour, increased longevity and a higher level of cultural attainment. To a measureable degree, man is now master of his own destiny where once he was subject only to the grim hand of Fate".

The Canadian Council on Nutrition has endeavoured to ascertain the extent to which Canadians secure an adequate diet. From the public health viewpoint this is a matter of much concern, especially at the present time when longer hours of work and greater physical and mental strains are making an extra drain on human vitality. In 1939 McHenry (2) reported the results of a dietary survey among low-income families in Toronto; this survey was conducted by a Toronto committee and not by the Council on Nutrition. The Canadian Council on Nutrition planned similar surveys to be carried out in Halifax, Quebec, Toronto and Edmonton. The Toronto survey was to be made on families with incomes between $1500 and $2400 so that a comparison could be made with the findings of the previous low-income survey. This report presents the results of the survey conducted in Toronto under the auspices of the Canadian Council on Nutrition.

Method of Selecting Families

Lists of families whose incomes were in the desired range were secured from several sources, the names of which cannot be disclosed. A wide variety of occupations was represented and the families were scattered throughout the city.

Letters were sent to these families asking for their co-operation. Miss Flora Webster, B.A., field worker for this survey, called upon each family and explained in detail the nature of the project and made plans with the housewife for collecting the data in those families who agreed to cooperate. A great deal of the success of this survey has been due to the tact shown by Miss Webster in these interviews.

Representative Nature of the Sample

Since it was only possible to utilize those families which agreed to co-operate, it might be said that these families were already interested in nutrition and had possibly taken steps to improve their nutrition. It follows that the state of nutrition found in these families may be better than would be found in an unrestricted sample of this class. All of the families were of British origin since it was impossible to secure the cooperation of foreign families. The sample then can only be considered to represent co-operative families of British origin. Consideration must also be given to the nature of the sample from the viewpoint of family size and family income. According to a communication from Mr. Greenway, Dominion statistician, "the Toronto sample represents, fairly accurately, an average of earnings levels above $1500 per year and the cases are well distributed between $1500 and $2400, making this range excellent for trend analyses. The average number of persons per family (3.91) compares closely with 1931 census averages (4.10) and with Dominion Bureau of Statistics 1938 samples of wage-earner families (4.35). In relation to the income ranges covered, the distribution of survey families according to the number of children appears to be satisfactory."

Method of Collecting and Calculating Data

Records were kept of family income, occupation of wage earner, and age, weight, height and sex of each individual in the household. The field worker made an exact inventory of food on hand at the beginning and end of the experimental week. Following the careful instructions of the field worker, each mother kept an account of all food purchased during the week and the weight of all food consumed by each individual in the family. From the food inventory the amount of money spent on food during the week was calculated. From the records of individual food intake, calculations were made of total calories, protein, fat, carbohydrate, calcium, phosphorus, iron and vitamins A, B_1, and C. Calculations of the nutritive value of the foods were made from the information provided by the Canadian Council on Nutrition Food Tables and from the United States Department of Agriculture Publication No. 275, Vitamin Content of Food, by Daniel and Munsell. The figures for the nutritive value of each individual's daily food intake were compared with those for the Canadian Dietary Standard formulated by the Canadian Council on Nutrition. We are indebted to Miss Lillian Barber for careful and diligent assistance in the calculations.

Survey Findings

The data were collected during a six-months' period beginning in November 1938 and ending April 1939. Satisfactory records were obtained from 80 families comprised of 313 individuals. The average number of individuals per family was 3.9 (2.3 adults and 1.6 children) with extremes of two to eight. The average family income was $38.16 per week with a minimum of $25.00 and a maximum of $62.50. The families were equally distributed on either side of the average. The highest per-person weekly income was $24.23, and the lowest $6.25, with an average of $11.00.

Total Caloric Intake

The average daily caloric intake for 93 men was 2540 calories. On the average the men received 100 per cent of the Canadian Dietary Standard for calories. Fifty-one per cent of the men were above the standard and only 7 per cent were below 70 per cent of the standard. The women secured an average of 1930 calories per day or 81 per cent of the standard for women. Only 16 per cent of the women were above the standard and 26 per cent were below 70 per cent of the standard.

The children have been divided into two age-groups, (1) from 11 to 18 years inclusive, (2) under 11 years. The caloric intake for each group is expressed as a percentage of the appropriate standard. The twenty boys from the older group received, on the average, 84 per cent of the standard for calories; 15 per cent of the boys were above the standard and 20 per cent were below 70 per cent of the standard. The twenty-five girls in this age group received 93 per cent of the standard. Thirty-two per cent of the girls received caloric intakes above the standard while 12 per cent were below 70 per cent of the standard. There were forty-five boys in the younger age group. Their caloric intake averaged 99 per cent of the standard with 50 per cent of the boys above the standard and only one boy below 70 per cent of the standard. The thirty-two girls in this group had an average intake of 94 per cent of the standard with 34 per cent above the standard and only two below 70 per cent of the standard.

The eighty families when considered as a group received on the average 93 per cent of the caloric standard. Twenty-eight per cent of the families were above the standard and only three families were below 70 per cent of the standard. Thus we may say that the caloric intake of the families was fairly satisfactory.

Protein Intake

The protein intake paralleled the caloric intake for all groups. The men and women received an average daily intake of 82 grams and 61 grams respectively. The average intake was 108 per cent of the standard for the men and 85 per cent of the standard for the women. Sixty-nine per cent of the men but only 17 per cent of the women were consuming diets which provided more protein than the standard. Three men and 21 women were below 70 per cent of their respective protein standard.

The intake for the children was good. The boys in the age-group 11 to 18 years received 86 per cent of the standard while the girls fared better at 96 per cent of their standard. Only two boys and three girls in this group were below 70 per cent of the standard. The younger group showed a similar picture, with the boys receiving 89 per cent of their protein standard and the girls 91 per cent. Only eight boys and three girls were below 70 per cent of the standard.

The average protein intake for the families was 95 per cent of the standard. Thirty-four per cent of the families had intakes above the standard and only two families were below 70 per cent of the standard. The supply of protein for these families appears to be, as in the case of calories, fairly satisfactory.

Fat and Carbohydrate Intake

The fat intake was adequate for every group. The men showed an average daily intake of 102 grams or 120 per cent of the standard; the women averaged 78 grams per day or 101 per cent of the standard. The children averaged 105 per cent of the standard and of the one hundred and twenty-two children only five had intakes below 70 per cent of the standard. The family average was 111 per cent of the standard and no family had an intake below 70 per cent of the standard. The average daily intake of carbohydrate was 305 grams for the men and 238 grams for the women.

Calcium and Phosphorus Intake

The family average showed a calcium intake of 116 per cent of the standard and a phosphorus intake of 105 per cent of the standard, with only two families below 70 per cent of the standard in calcium and only one family below this figure in phosphorus. This is in marked contrast to the calcium supplies found in the survey on low-income families in Toronto, in which case the average amount of calcium was 70 per cent of the standard.

The diets in the present survey provided sufficient calcium for the family as a whole but due to an unequal distribution of the available calcium certain individuals in the family received a most unsatisfactory intake.

The teen-age girls received only 71 per cent of the calcium standard. Ninety-two per cent were below the standard and 44 per cent were below 70 per cent of the standard. The boys in this age group fared better, with intakes of 94 per cent of standard; 60 per cent were below the standard but only 10 per cent were below 70 per cent of the standard. The boys and girls under 11 years received respectively 95 per cent and 98 per cent of the calcium standard. Fifty-five per cent of the boys and 69 per cent of the girls were below the standard. Fifteen per cent of the boys and 12 per cent of the girls had calcium intakes below 70 per cent of the standard.

The figures for men show an adequate calcium intake. The men averaged 139 per cent of the standard, with 75 per cent of the men above the standard (44 per cent in the low-income survey) and only three men below 70 per cent of the standard. On the average, the women showed a good intake of 108 per cent of the standard. However, in contrast to the men only 52 per cent of the women were above the standard (29 per cent in the low-income survey) and twelve women (13 per cent) were below 70 per cent of the standard.

Thus while the family as a whole received sufficient calcium the girls between the ages of 11 and 18 years had a deficiency and the women received only a fair supply.

The milk consumption indicates this trend. The girls in the teen-age group consumed 0.74 pints per day in contrast to the boys in this age group who consumed 0.99 pints per day. The milk consumption of the women was 0.40 pints per day in contrast with the men at 0.50 pints per day. The younger boys and girls who fared better in calcium were consuming, respectively, 0.80 and 0.87

pints of milk daily. The men and children in the low-income survey consumed only half this quantity of milk, the women 0.35 pints per day.

Iron Intake

In almost every instance the iron requirement of the men was satisfied. The men averaged 137 per cent of the standard with only eight men below the standard and only two men below 70 per cent of the standard. There are two probable reasons for this situation with regard to the men, first, the larger intake of food by them and second, the lower iron requirement for men.

There was a marked iron deficiency in the women. The average daily intake was 10.6 grams or 71 per cent of the standard. Ninety-six per cent of the women were, however, below the standard and 44 per cent were below 70 per cent of the standard. While the average iron intake for the women in this survey is higher than that for the low-income survey (53 per cent of the standard) it is decidedly below par. In view of the high iron requirement for women the situation as reflected by this survey calls for attention.

The teen-age girls also fared poorly. Their average percentage of the standard was 80 per cent, with 92 per cent of the group below the standard. Only 24 per cent of this group were below 70 per cent of the standard. The boys of this age received 93 per cent of the iron standard; 70 per cent were below the standard but only 20 per cent were below 70 per cent of the standard. The younger boys received 87 per cent of the standard and the younger girls 89 per cent of the standard. Eighty-two per cent of the boys were below the standard and 30 per cent were below 70 per cent of the standard. The respective figures for the girls were 75 per cent and 37 per cent, a somewhat less adequate iron intake.

The families, on the whole, received a fair supply of iron. The family average was 99 per cent of the standard. Fifty-seven per cent of the families were below the standard and 6 per cent were below 70 per cent of the standard. An unequal distribution of food constituents within the family is again evident.

The Vitamin Intake

It is most difficult to appraise the dietary intake in regard to the vitamins owing to the scarcity of figures on vitamin content, lack of agreement as to the best methods of assay, and the uncertainty of human requirements. The daily adult requirement has been set at 6000 I.U. vitamin A, 500 I.U. vitamin B_1, and 1200 I.U. vitamin C. The daily requirement of the child which has been used as the standard of comparison in this survey is as follows: Vitamin A, 100 I.U. per kilogram of body weight; vitamin B_1, infants 100 I.U., children 2-18 years 500 I.U.; vitamin C, 800 I.U. These standards for vitamins have been adopted by the Canadian Council on Nutrition for all dietary surveys.

The vitamin A intake was more nearly adequate than that of vitamins B_1 and C. Only five of the eighty families were below 70 per cent of the standard for vitamin A and of the 309 individuals only 6 per cent were below 70 per cent of the standard.

The intake of vitamin B_1 presents a very different picture. Only eight families and twenty-eight individuals met the standard of adequacy for vitamin B_1. The average daily intake per family was 69 per cent of the standard. Ninety per cent of the families had intakes below the standard and 57 per cent of the families were below 70 per cent of the standard. When the individual intakes within the family are cited it is evident that 90 per cent of the people would be considered deficient in vitamin B_1. The men fared best and the women worst, with the children in an intermediate position. The men averaged 77 per cent of the standard. Eighty-five per cent were below the standard and 38 per cent were markedly deficient (below 70 per cent of the standard). The daily average for the women was 57 per cent of the standard. Only one woman received an intake which met the standard and 76 per cent of the women were below 70 per cent of the standard. The teen-age boys and girls showed an average daily intake of 68 per cent and 62 per cent of the standard respectively. Fifty per cent of the boys and 60 per cent of the girls had intakes below 70 per cent of the standard. Only three boys and one girl succeeded in meeting the standard requirement of vitamin B_1. The boys under 11 years averaged 67 per cent of the standard and the girls 80 per cent. Four boys and five girls met the requirement while 70 per cent of the boys and 75 per cent of the girls were receiving less than 70 per cent of the requirement.

Vitamin C is the last of the nutritive elements to be considered. The level of vitamin C intake is higher than that of vitamin B_1 but much lower than that of vitamin A. The men, women and the teen-age boys showed deficient intakes of vitamin C. The family as a whole received 90 per cent of the standard, sixty-seven per cent of the families failed to meet the standard and 31 per cent were below 70 per cent of the standard. The average daily intake for the men was 1009 I.U. or 85 per cent of the standard; for the women 936 I.U. or 78 per cent of the standard. Seventy-one per cent of the men and 78 per cent of the women were below the standard; 34 per cent of the men and 47 per cent of the women received less than 70 per cent of the standard. The teen-age boys appeared to do well on the average (104 per cent of the standard) but 35 per cent were below 70 per cent of the standard. The vitamin C intake of the teen-age girls seems to reflect the general observation that girls of this age, in an endeavour to keep slim, show a preference for fruits. These girls had an average vitamin C intake which was 142 per cent of the standard; 88 per cent of the girls were receiving more vitamin C than the standard and only two girls out of the twenty-five were below 70 per cent of the standard. Children under 11 years had a fairly satisfactory intake of vitamin C. The boys received 92 per cent of the standard and the girls 98 per cent; 27 per cent of the boys and 25 per cent of the girls had intakes below 70 per cent of the standard.

The results of the survey are shown in table 1. It may be observed that all individuals were deficient in vitamin B_1, the men, women and teen-age boys in vitamin C and the women and teen-age girls in calcium and iron.

We have compared the results of the survey on low-income families made by the Toronto Committee for Dietary Surveys with those of the present survey.

Generally speaking, more marked and more widespread deficiencies existed in the low-income group. Attention has already been focussed on some of the most

TABLE 1

Summary of Toronto Survey

	Families		Men		Women		11–18 years				Under 11 years			
							Boys		Girls		Boys		Girls	
	Daily intake Per cent of Standard	Per cent of group below 70% Standard	Daily intake Per cent of Standard	Per cent of group below 70% Standard	Daily intake Per cent of Standard	Per cent of group below 70% Standard	Daily intake Per cent of Standard	Per cent of group below 70% Standard	Daily intake Per cent of Standard	Per cent of group below 70% Standard	Daily intake Per cent of Standard	Per cent of group below 70% Standard	Daily intake Per cent of Standard	Per cent of group below 70% Standard
Calories	93	4	100	7	81	26	84	20	93	12	99	2	94	6
Protein	95	3	108	3	85	22	86	10	96	12	89	18	91	10
Calcium	116	3	139	3	108	13	94	10	71	44	95	15	98	12
Iron	99	6	137	2	71	44	93	20	80	24	87	30	89	37
Vitamin A	197	6	158	10	134	15	174	15	213	8	440	0	355	0
" B_1	69	57	77	38	57	76	68	50	62	60	67	70	80	75
" C	90	31	85	34	78	47	104	35	142	8	92	27	98	25

striking differences. On the average, the families in the higher income bracket received 47 per cent more calcium, 37 per cent more iron, and 17 per cent more calories and protein than those in the low-income range.

Is this situation due to the higher income, to more efficient food purchasing or to a combination of these two factors? In table 2 the families are grouped

TABLE 2

Income per person per week	Type of Survey	Per Cent Canadian Dietary Standard Cal.	Pro.	Ca	Fe
$2.00—2.99	Low-income	72	72	62	56
	High "	91	90	100	83
$3.00—3.99	Low-income	78	78	69	62
	High "	91	93	107	94
$4.00—4.99	Low-income	83	81	77	69
	High "	92	92	106	99

according to income per person. With the same per person income the families in the higher income group secured in every instance a more nearly adequate food intake. It would appear, then, that these families obtained better food value for their money than the families in the low-income group. While income seems to affect the intake of calcium and iron in the higher income group it seems to have little effect in regard to calories and protein. In the low-income group, an

increase in the per person income helps to offset the inefficient purchasing and, in consequence, the nutritive value of the dietary is improved.

In the high-income group the average weekly food expenditure per family was $9.50 or $2.50 per person. The minimum food expenditure per person was $1.61 and the maximum $4.36. The family which spent $1.61 per person on food obtained a diet which averaged 90 per cent of the standard; and every constituent, with the exception of vitamin B_1, was above 70 per cent of the standard.

The results of both Toronto surveys give concrete evidence of the need for restoring to foods the B vitamins which have been removed by modern processing methods. Action in this regard has already been taken by Great Britain and the United States. The results also point to the need for educational work giving information about nutritive values in relation to food cost. Especially great is this need among families with low purchasing power. An increasing amount of evidence shows clearly that many families are spending sufficient money to secure an adequate diet but are failing to do so because of a lack of knowledge regarding economical purchasing. Educational effort, by fostering an appreciation of the relation of diet to health, could increase the level of dietary adequacy at every income level. Education is only one of the many channels which could aid in raising the nutritional level of the people. Lower food costs, greater food production and increased purchasing power would also help to favourably influence the nutritional status.

SUMMARY

A study of food consumption of individuals in a group of Toronto families having yearly incomes between $1500 and $2400 has shown that total supplies of food, amounts of protein, fat, carbohydrate, calcium, phosphorus and vitamin A are fairly satisfactory. There is a widespread deficiency of vitamin B_1 and the quantities of vitamin C available cannot be regarded as adequate. Marked deficiencies of calcium and iron were found in the food consumption of women, and of calcium among teen-age girls. An urgent need for nutritional education is clearly indicated.

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A Dietary Survey in Edmonton

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IT is of some importance that the type of dietary survey here reported be understood in relation to other types of dietary survey. Three main types may be distinguished.

A. The most general is that which infers the dietary state of the population as a whole, from statistical data, obtained from government departments and other sources, of the country's food supplies. The approximate average consumption of various food items per head per week, and like information, can thus be obtained. National surveys of this kind have a greater usefulness for agricultural and marketing purposes than they have perhaps for public health purposes.

B. Dietary surveys as commonly understood involve at some point family food budgeting. It may be referred to as the *family inventory method*. Extensive surveys have been carried out in many countries, largely through the stimulus of the Health Organization of the League of Nations, by the inventory method, using the family unit. In such surveys, information is obtained from records of food purchases and from differences of food supplies on hand at the beginning and end, usually of a seven-day survey period. Thus a closer approximation than that obtainable by method A, of the food consumed by the families surveyed is arrived at. And if the families have been chosen as representative of, for example, a certain income level, a certain rural or urban area, then wider generalizations may be valid.

In "Food, Health and Income" (1936), Orr has used a combination of methods A and B. By the use of 1152 inventories he thus arrives at conclusions concerning the diet of the population of Great Britain.

C. Health and dietary adequacy or inadequacy are, however, matters that concern the individual rather than the family, and on this ground it is desirable to have a dietary survey in which the individual becomes the unit. Thus we have the third type of dietary survey, C, which may be called the *individual consumption method*. This is the method of the present survey.

It should be clear, however, that our method is concerned strictly with the diet of the individual and not directly with the individual; the method is physiological only by inference. However, the physiological inference from the present method is more mediate than that from other methods. In other words, as we proceed from method A, to B, to C, our observational data become more relevant to the individual. But the data, and hence the method, become physiological only when the individual is observed or examined.

Dietary surveying is in the experimental stage and calls for critical assess-

ment of method and technique by those engaged in it. The present method, sponsored by the Canadian Council on Nutrition in that spirit, is, it should be emphasized here, practically a new method. Its general plan was developed by a committee in Toronto where the first survey was reported by McHenry (1939). There was new information about family diets in McHenry's report. Like McHenry, we find that the assumption the inventory method is compelled to make, namely that the family food is fairly apportioned, is not justified. This means that a health hazard, in some cases concealed by the inventory method, is revealed for certain members of the family by the individual-consumption method.

It may be observed that new methods of diagnosing deficiency of specific dietary factors are developing. This is notably true for certain vitamins. The measurement of the rate of regeneration of visual purple promises to provide a simple method for assessing the adequacy of vitamin A in the body (Pett). The amounts of vitamin B_1 (Cowgill), nicotinic acid (Sebrell), and vitamin C (Smith) excreted in the urine, serve as a gauge of the level in the blood and hence as a test of dietary adequacy. Practicable methods for a large-scale survey of those vitamins in the urine are now available. It is also noteworthy that these new methods of measuring dietary adequacy are physiological. They thus measure nutritional status, with respect to relevant food factors, as distinct from dietary status.

The use of such tests, and other clinical means available, alongside such a survey as is described here, seems to us to be necessary in what, after all, is but a preliminary attempt to find means of diagnosing food factor deficiences. The advisability of carrying out vitamin surveys without reference to other food factors should also be considered.

GENERAL NATURE OF THE EDMONTON SURVEY

The field work was carried out in Edmonton over the period September 12 to November 9, 1939. The survey included 76 families, comprising 323 persons. The average number of children per family was 2. Eighty-eight per cent of the group were British, 9 per cent French, and 3 per cent either Scandinavian or Chinese. The group can be regarded as average Canadian families receiving yearly incomes between $500 and $1500. Some 60 per cent of all Canadian families are in this income range. The heads of all the families surveyed were employed wage-earners. About three-quarters were doing medium to heavy work and about one-quarter were doing clerical work. Two were school teachers and one was a minister. Most of the families lived on the outskirts of the city. Many owned their homes or were buying them. Many of the homes had a garden and in a few cases a cow was kept.

The survey was on a purely voluntary basis. We should have liked to include a greater number of families living in typical blocks of city workers' houses, but very few in these localities were willing to cooperate. Although they were assured that their names would not be revealed, many appeared to be

suspicious of our motives, while others were ignorant of their food problems or not interested in them.

The group studied is thus perhaps in a somewhat better economic position than the average Canadian family in the income bracket mentioned. The mere fact that a family cooperated with us we regard as an indication, if not of a higher intelligence, certainly of an ambition to improve their conditions and especially of a desire to have their children as well nourished as possible. The typical apartment dweller on the other hand is likely to have higher overhead expenses for rent and his chances of being well fed are diminished appreciably through not having a vegetable garden.

Carrying Out the Survey

When a family was willing to cooperate with us, one of our workers—all graduates in Household Economics and all advised of the need for tact and patience—visited the housewife and stayed with the family during the preparation and course of a meal. On this first visit all foods in stock were weighed by scales provided by us and listed in a notebook in which all information for the week's period of survey was subsequently entered. The housewife was given a sheet of written instructions and the procedure was explained by our worker.

Next day one of our workers visited the housewife to see that everything was being properly done. Sometimes it was not. If some little departure from schedule had occurred, allowances were made for it during the visit. One of our workers called some time every day, so that we have considerable confidence in our records.

The primary object of the survey was to obtain an accurate record of the foods consumed at each meal by each individual in the family over a seven-day period. To get such information the housewife was required to weigh and enter in the notebook the amount of each ingredient in all specially prepared foods; for example, the amount of oatmeal, salt, and water in porridge, the amount of milk, flour, butter and sugar in pudding, and so on. Then it was required to know the amount of porridge served to the individual members of the family and the amount of milk each took with the porridge. Similar information was obtained for each meal in the day for each member of the family during the seven days.

In the course of this investigation we were impressed with the measure of intelligent cooperation displayed by "the average Canadian housewife" in a really complex and difficult undertaking. At the end of it most of them were very grateful for our advice on how they might improve the feeding of their families.

Calculation of the Results

From the notebooks we listed all the different foods consumed during the week by each individual. The weekly intake of each food was recorded in grams. From food-analysis tables we calculated the calories that each food yielded, and by summation obtained the calories consumed by each individual for the week. Sometimes a member of the family missed a meal or two at home. In such cases

the total calories for the week were divided by the number of meals eaten, and this figure multiplied by three to give the daily intake of calories; similar estimates were made for protein, fat, calcium, iron, and the vitamins A, B_1 and C. The Canadian Council on Nutrition has set up standards for each of these food constituents, referred to in the following discussion as the Canadian Dietary Standard.

RESULTS

The results of the survey will first be discussed according to the individual food constituents, and then some attempt made to summarize the findings.

It may be noted here that the terms normal, adequate, or sufficient, refer to dietary levels over 89 per cent of the Canadian Dietary Standard. The terms inadequate or deficient refer to dietary levels lower than 90 per cent. The term grossly deficient refers to levels below 60 per cent of the standard.

Calories

The average daily calorie consumption for the whole group was 2047, which is 87 per cent of the Canadian Dietary Standard for calories.

All the members in 11 of the 76 families received diets adequate in calories, while all the members in 14 families received diets deficient in calories. In the rest of the families one or more members received diets deficient in calories.

Forty-four per cent of the diets of all children up to the age of 12 were deficient in calories; 64 per cent of the diets of those between the ages of 12 and 18 were deficient. Forty-two per cent of the diets of all men (over the age of 18) and 78 per cent of the diets of all women were deficient. Of the whole group 44 per cent had diets adequate in calories, 47 per cent diets deficient in calories, and 9 per cent diets grossly deficient in calories. The last group was composed mostly of women and children.

Protein

The average daily protein consumption for the whole group was 61.5 grams, or 84 per cent of the Canadian Dietary Standard for protein. All the members in 6 of the 76 families received diets adequate in protein, while all the members in 18 families received diets deficient in protein. A little over 60 per cent of all age groups had diets deficient in protein. Of the whole group 38 per cent had diets adequate in protein, 50 per cent diets deficient in protein, and 12 per cent diets grossly deficient in protein. Of the last group 82 per cent were mothers and children.

Fat

The average daily fat consumption for the whole group was 80.5 grams or 98 per cent of the Canadian Dietary Standard for fat. All the members in 24 of the 76 families received diets adequate in fat, while all the members in 6 families received diets deficient in fat. About 45 per cent of all age groups had diets deficient in fat. Sixty-six per cent of the teen-age group had diets deficient in fat. Of the whole group 55 per cent had diets adequate in fat, 33 per cent

diets deficient in fat, and 12 per cent diets grossly deficient in fat. The group surveyed was more adequately supplied with fat than with any other item.

Calcium

The average daily calcium consumption was 0.67 gram, or 79 per cent of the Canadian Dietary Standard for calcium. All the members in 9 of the 76 families had diets adequate in calcium, while all the members in 11 families had diets deficient in calcium. Seventy-four per cent of the children under 6 had diets deficient in calcium, as did 76 per cent of the children 6 to 12 years and 90 per cent of the children 12 to 18 years. Twenty-eight per cent of all men and 66 per cent of all women had diets deficient in calcium. Of the whole group, 37 per cent had diets adequate in calcium, 36 per cent diets deficient in calcium, and 27 per cent diets grossly deficient in calcium. Of the grossly deficient group —more than a quarter of the people surveyed—74 per cent were children.

Iron

The average daily iron consumption was 10 milligrams, or 80 per cent of the Canadian Dietary Standard for iron. In only one of the 76 families did all the members have diets adequate in iron. All the members in 10 families had diets deficient in iron. Nearly 90 per cent of all children up to 18 years had diets deficient in iron. Only 5 per cent of the men had this deficiency, whereas 95 per cent of the women were receiving an inadequate amount of iron. Of the whole group, 32 per cent had diets adequate in iron, 41 per cent diets deficient in iron, and 27 per cent diets grossly deficient in iron.

Serious iron deficiency is on a par with the serious calcium deficiency. Nearly 90 per cent of those grossly deficient in iron were women and children.

Vitamin A

The average vitamin A consumption for the whole group was 5392 International Units, or 125 per cent of the Canadian Dietary Standard for vitamin A.

All the members in 12 of the 76 families had diets adequate in vitamin A and all the members in 7 families had diets deficient in the vitamin. Of children up to 12 years, less than 10 per cent had diets deficient in vitamin A. In the group from 12 to 18 years the percentage was 42. Fifty-two per cent of the men and eighty per cent of the women received insufficient vitamin A. Eighty-two per cent of the children had diets adequate in vitamin A, 14 per cent diets deficient in vitamin A, and 4 per cent diets grossly deficient. Thirty-three per cent of the adults had diets adequate in vitamin A, 44 per cent deficient, and 23 per cent grossly deficient.

The children are thus fairly adequately supplied with the vitamin, but the adult intake leaves much to be desired.

Vitamin B_1

The average vitamin B_1 consumption for the whole group was 243 I.U. or 53 per cent of the Canadian Dietary Standard for vitamin B_1. There was no

family in which all the members had an adequate supply of the vitamin. In 55 families all the members had diets deficient in B_1. Seventy-three per cent of all children up to 6 years had diets deficient in B_1, and over 90 per cent of all other age groups. Of the children, 7 per cent had adequate diets, 23 per cent deficient diets, and 70 per cent grossly deficient diets. Five per cent of adults had adequate diets, 18 per cent deficient diets, and 77 per cent grossly deficient diets.

According to present standards, vitamin B_1 deficiency is widespread and serious in degree.

Vitamin C

The average vitamin C consumption for the whole group was 904 I.U., or 90 per cent of the Canadian Dietary Standard for vitamin C. There were 5 families in which all members received diets adequate in vitamin C and 25 families in which all members had diets deficient in the vitamin. Diets deficient in vitamin C were found in 84 per cent of children up to 6 years, in 60 per cent of the 6-12 age group, in 32 per cent of the 12-18 age group, and in 73 per cent of all adults. Thirty-seven per cent of the children had adequate amounts of vitamin C, 48 per cent inadequate amounts, and 15 per cent grossly inadequate amounts. Of the adults, 27 per cent had adequate diets, 50 per cent deficient, and 23 per cent grossly deficient.

The findings with regard to vitamin C are more favourable than those respecting B_1, but less favourable than those respecting A, particularly in young children. Teen-age children are more adequately supplied with the vitamin than any other age group.

As found for the other food constituents, women are less adequately supplied with the vitamins than men.

ECONOMIC CONSIDERATIONS

Precise annual incomes were not requested of the families surveyed, although in many cases this was voluntarily proffered. In most cases, however, we obtained only the information as to whether the income lay in the range $500—$1000 a year, or in the range $1001—$1500 a year.

An analysis of our data by Professor Andrew Stewart, of the Department of Economics, shows the effect of income in the following way. Two groups were chosen: firstly, a group with incomes per person up to $250 a year, and secondly, a group with incomes of $251—$500 a year. These we shall refer to as the "low" and "high" income groups.

Calories: The low income group showed 60 per cent deficient; the high income group 48 per cent deficient.

Protein: The low income group showed 64 per cent deficient; the high income group 48 per cent deficient.

Fat: The low income group showed 57 per cent deficient; the high income group 30 per cent deficient.

Calcium: The low income group showed 70 per cent deficient; the high income group 50 per cent deficient.

Iron: The low income group showed 71 per cent deficient; the high income group 60 per cent deficient.

Conclusions

The detailed results given above perhaps speak more meaningfully than can any generalizations about them. Certain broader statements are, however, valid.

About 40 per cent of the people studied are adequately fed, another 40 per cent get about three-quarters of what they need, and nearly 20 per cent get little more than half of what they need.

Food is not fairly distributed in the family. The worst fed member is the mother; the best fed the father, or wage earner. Of the children, except for vitamin C, the worst fed is the teen-age youngster, who, few people realize, needs more food than the average adult.

The most extreme deficiencies found in a large proportion of the people surveyed were in calcium, iron, and vitamins B_1 and C. It is to be regretted that a medical examination was not carried out in the grossly deficient group. If the week's diet here recorded is typical of a prolonged period—and we have no grounds to question it—it is almost certain that clinical evidence of faulty bone, anemia, and vitamin deficiency would be found.

Our results indicate that diet tends to improve automatically with increase of income. It is, however, a slow process. The only means left to try to maintain the health of the population—in so far as that is possible by adequate diets—is to teach people to make the most of their available money. With some sacrifice in variety the degree of adequacy attained in a few of our poorer families is astonishing.

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EDITORIAL SECTION

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SIR FREDERICK BANTING

"THE greatest joy in life is to accomplish. It is the getting, not the having. It is the giving, not the keeping." These words from the Cameron Prize Lecture, delivered by Sir Frederick Banting before the University of Edinburgh in 1928, express the spirit of his life. His was truly a life of service.

Sir Frederick was born in Alliston, Ontario, in 1891. He graduated in medicine from the University of Toronto in 1916. He saw service in the Canadian Army Medical Corps as a private and was wounded in September 1918. He was awarded the Military Cross for bravery and devotion in the field. Re-entering civil life, he practised for less than a year and in 1920 entered the Department of Physiology of the University of Western Ontario. In 1921 he returned to his Alma Mater to carry on, with Dr. C. H. Best, the study which resulted in the great discovery of Insulin. Insulin has improved the health and lengthened the lives of countless persons. These are the accomplishments of preventive medicine in its broadest interpretation and thus the discovery of Insulin ranks with the achievements of Jenner, Pasteur, and the other great benefactors of humanity. In prompt recognition of his great contribution many universities and scientific organizations conferred on him honorary degrees and medals. He shared in the Nobel Prize in Medicine for 1923 and in the same year was made first Professor of Medical Research, University of Toronto, a chair established in his honour. From that time he continued to be active in prosecuting and directing research and published numerous scientific papers. In 1934 he was made Knight Commander of the Order of the British Empire (Civil Division) in recognition of the benefits of his work to mankind. No honours which he received, however, meant as much to him as the little gifts made by the group of diabetic children in the clinic of Dr. Joslin. Diabetes in the young is very severe. The advent of Insulin changed the whole outlook of childhood diabetes. So, too, Insulin restored the joy of living to unknown thousands of older diabetic sufferers.

In the Cameron Lecture Sir Frederick revealed his philosophy of life: "I am a firm believer in the theory that you can do or be anything that you wish in this world, within reason, if you are prepared to make the sacrifices, think

FREDERICK GRANT BANTING, K.B.E., M.C., M.D., LL.D., F.R.S., F.R.C.P., F.R.C.S.(Eng.), F.R.C.S.(C.), F.R.S.C.

and work hard enough and long enough." Having in mind the students before him, he spoke of the requirements of one entering the field of research and it was in these circumstances that the words quoted were spoken. Only such an occasion would have induced him to reveal the deepest feelings of his nature.

His accomplishments, the honours which he received, and the great work in which he was engaged have been reviewed in the many tributes published in the press and in scientific journals. It is difficult to express the magnitude of the loss which Canada and the world has suffered in his death.

NUTRITION IN CANADA

IN 1937 there was little accurate information available regarding Canadian food habits. The Dominion Department of Agriculture had conducted several studies under the direction of Dr. Hopper; these had provided useful data regarding the consumption of milk and of certain protein foods. Nutritionists, without specific information on actual dietary deficiencies, relied upon guesses as to nutritional conditions in Canada. In 1937 Professor Andrew Stewart began a survey of food purchases in Alberta and the Toronto Committee on Dietary Surveys commenced a study of dietary conditions in low-income families in Toronto. Early in 1938 the Canadian Council on Nutrition was organized. One of the essential features of the program drafted by the Council was an effort to secure accurate information regarding Canadian food habits.

In this issue are four preliminary reports of dietary surveys conducted under the auspices of the Canadian Council on Nutrition. Three of these deal with families in Halifax, Quebec, and Edmonton, having annual incomes of less than $1500; the fourth is concerned with Toronto families with yearly incomes ranging between $1500 and $2400. The three low-income surveys, and the one previously conducted by a Toronto committee, provide data regarding dietary conditions in low-income urban families; the results of these may be compared with those accruing from the higher income group. The five surveys, studied together, furnish a striking picture of nutritional conditions in Canadian cities.

The food supplies of low-income families are not satisfactory. In many cases there was not sufficient food available to furnish needed calories or satisfactory amounts of most food constituents; this was particularly true in Toronto. Food consumption studies have frequently been carried out by recording food purchases; all these Canadian surveys have been done on an individual basis. For this reason the surveys have given a clear picture of conditions within the family. Fathers are the best fed, younger children next, then older children, and the mothers are the most poorly fed members of the family. This situation can be readily understood if we remember that the mothers serve the food and do so in a most unselfish manner. The question should be raised as to whether the unequal division of food is wise, even if done from the best motives. For the welfare of the country, mothers should be as well fed as the fathers.

All of the low-income surveys show that there is a shortage of protective foods which can be relied upon to furnish minerals and vitamins. Three marked

deficiencies are evident: calcium, particularly for the children, the B vitamins for all individuals, and iron for women and children. The higher income families in Toronto had definitely better supplies of food but, even in these families, there was a deficiency of the B vitamins. One conclusion is clearly evident from these surveys: many families in Canada are not securing supplies of food adequate for health, for proper growth of children, and for working efficiency. Canada, a land of plenty with ample food resources, has a nutrition problem.

Why should malnutrition exist in this country? It is possible to secure an adequate diet from Canadian food sources. Food supplies are available, or could be made so, to give everyone an optimal diet. These are only two reasons for a failure to secure proper food supplies, the inability of some families to purchase an optimal diet, and a lack of nutritional information. Perhaps nothing can be done about the economic factor but education can be provided. Many of the low-income families studied in these surveys could have had better food supplies if the mother had been trained to buy economically. There is an urgent need for an intensive, national undertaking to provide nutritional education, particularly for low-income families. Several organizations now exist which could do this work admirably. In time of war it is particularly important that our people be as well fed as possible to maintain health and working efficiency on a high plane. The level of Canadian nutrition is not satisfactory and it can be markedly improved with little expense by providing needed information. An improvement in food habits in Canada would mean better health and would have a beneficial effect upon markets for Canadian farm products.

THE 1940 CANADIAN HEALTH CONSERVATION CONTESTS

THE committee in charge of the 1940 Canadian Health Conservation Contests announced on April 17th the winners—cities and counties placed on the National Health Honour Roll—of the 1940 Contests.

In the Rural Contest the winners were:

Eastern Division:

Terrebonne County Health Unit, St. Jerome, Quebec.
St. Jean-Iberville-Laprairie-Napierville Health Unit, St. Jean, Quebec.

Western Division:

Peace River Health Unit, Pouce Coupe, British Columbia.
St. James-St. Vital Health Unit, Manitoba.

In the City Contest:

Group 1. Cities over 100,000 population with full-time services:

Windsor, Ontario.
Hamilton, Ontario.

Group 2. Cities under 100,000 with a full-time medical officer:

Saint John, New Brunswick.
London, Ontario.

Group 3. Cities under 100,000 with a part-time medical officer:
St. Catharines, Ontario.

Inclusion in the Honour Roll, an award desired by all participants and appreciated by those attaining it, does not mean that these are necessarily the healthiest cities and counties. It does mean that they have been judged by a group of health experts to have provided the most effective community-wide health-protection services for their people. In short, they are the cities and counties which have organized on a community-wide basis to solve as effectively as possible their public-health problems, including water supply, sewage disposal, tuberculosis, syphilis, industrial hazards, maternal and child health problems, and milk supply. They are the cities and counties which have made greater progress in solving their own health problems than have other participants in the Contests.

In addition to the major awards, certificates indicating "commendable attainment and improvements in public health" have been granted to the cities of Lachine, Que., Montreal, Que., Three Rivers, Que., Kingston, Ont., Ottawa, Ont., and Vancouver, B.C., and to the following county health units in Quebec: St. Hyacinthe-Rouville, Laviolette, and St. Maurice.

This is the fourth year that the Canadian Rural Health Conservation Contest has been held. More than thirty units were enrolled. The Contest has, since its inception, been conducted by the Canadian Public Health Association in co-operation with the American Public Health Association and with the financial support of the W. K. Kellogg Foundation of Battle Creek, Michigan.

More than twenty cities participated in the City Health Conservation Contest, held for the first time this year. Like the Rural Contest, it is conducted by the Canadian Public Health Association in co-operation with the American Public Health Association. It is financed by the Metropolitan Life Insurance Company. Much of the credit for the success of this first City Contest is due to Dr. James Wallace, formerly of the field staff of the American Public Health Association.

The awards will be presented at a luncheon on Wednesday, June 11th, during the thirtieth annual meeting of the Association which will be held in the Chateau Frontenac, Quebec, June 9th to 11th.

Thirtieth Annual Meeting

CANADIAN PUBLIC HEALTH ASSOCIATION

QUEBEC, JUNE 9th-11th, 1941

HEADQUARTERS: CHATEAU FRONTENAC

DIRECTORY OF SESSIONS

MONDAY, JUNE 9th

8.30 a.m. REGISTRATION. Fee $1.00.

Section Meetings:

9.30 a.m. First Meeting of the Personnel of the Ministry of Health.
10.00 a.m. Epidemiology and Vital Statistics.
10.00 a.m. Sanitary Inspectors.
10.00 a.m. Public Health Nursing.
10.00 a.m. Business Meeting of Travelling Chest Clinicians of the Province.
11.00 a.m. Tuberculosis.

12.30 p.m. Luncheon: Executive Council, Canadian Public Health Association (Business Meeting).
12.30 p.m. Luncheon: Public Health Nurses.
12.30 p.m. Luncheon: Tuberculosis.
2.30 p.m. First General Session.
8.30 p.m. Second Meeting of the Personnel of the Ministry of Health.

TUESDAY, JUNE 10th

Section Meetings:

9.30 a.m. Epidemiology and Vital Statistics.
9.30 a.m. Public Health Nursing.
9.30 a.m. Sanitary Inspectors.
9.30 a.m. Tuberculosis.
9.30 a.m. Public Health Education (Nutrition).

12.30 p.m. General Luncheon.
1.45 p.m. Demonstrations at the County Health Unit of Lévis.
2.30 p.m. Second General Session.
7.30 p.m. Annual Dinner.

WEDNESDAY, JUNE 11th

Section Meetings:

9.30 a.m. Tuberculosis. The meeting will be held at Laval Hospital with a joint session of La Société de Phtisiologie.
9.30 a.m. Sanitary Inspectors.
9.30 a.m. Industrial Hygiene.
9.30 a.m. Social Hygiene.
9.30 a.m. Public Health Education.

12.30 p.m. Luncheon: Presentation of Awards in the 1940 Canadian Health Conservation Contests.
2.00 p.m. Third General Session.
2.00 p.m. Business Meeting of the Nurses of the Ministry of Health.

A MESSAGE FROM THE HONORARY PRESIDENT OF THE CANADIAN PUBLIC HEALTH ASSOCIATION

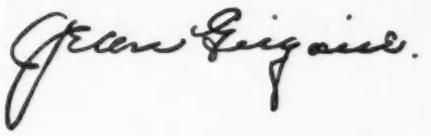
The Province of Quebec is pleased to have the honour of receiving the members of the Canadian Public Health Association this year. It affords us an opportunity of showing eminent health experts the progress made in the field of public health by the people of what was once New France. It will also be an auspicious occasion for the Association, since its members will be given a chance to reaffirm their intention to co-operate with the defenders of democracy. Who but health experts can assure the nation of strong soldiers, robust sailors, and lucid aviators? Public health is the foundation-stone of a strong and long-lived nation. May your meetings here be profitable! Quebec will extend to you a warm welcome. We invite you to spend three days in our midst and it is hoped you will all be able to accept this invitation.

Hector Gouin

Minister of Health and Social Welfare,
Province of Quebec.

A MESSAGE FROM THE PRESIDENT OF THE CANADIAN PUBLIC HEALTH ASSOCIATION

At no time in the history of the human race has it been more important to safeguard public health than it is today. In this hour of trial, when two civilizations are in conflict, every individual person is indispensable. Each one must be taken care of and the necessary means employed to keep all in good health. The Canadian Public Health Association realizes this better than anyone else and is doing everything in its power to spread the knowledge of hygiene, to safeguard our human capital, to protect our labourers, our families and the generations to come. We must not let the will to do be deterred by fear of the work entailed, nor must we forget our obligations towards our fellow-men. Physical and mental hygiene are an absolute necessity in times like these. The factory worker, like the soldier, sailor and airman, must enjoy perfect health to carry on his work. By its general work, as well as by its annual convention, the Canadian Public Health Association intends to do its share in this fight for the preservation of our civilization.



Deputy Minister of Health and Social Welfare,
Province of Quebec.

PRELIMINARY PROGRAM

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MONDAY, JUNE 9th, 8.30 A.M.

REGISTRATION

All delegates are requested to register at the Registration Desk. The fee is $1.00 for members and for guests.

MONDAY, JUNE 9th, 9.30 A.M.

FIRST MEETING OF THE PERSONNEL OF THE MINISTRY OF HEALTH

MONDAY, JUNE 9th, 10.00 A.M.

SECTION OF EPIDEMIOLOGY AND VITAL STATISTICS

Chairman: DR. J. WYLLIE, Professor of Preventive Medicine, Queen's University, Kingston, Ontario.

Vaccination against Typhoid Fever in Settlements. DR. EMILE MARTEL, Health Unit, Amos, Quebec.

A Typhoid Carrier for Fifty-Two Years. DR. J. U. BEDARD, Health Unit, Shawinigan Falls, Quebec.

A Milk-Borne Typhoid Outbreak in Trois Pistoles, Quebec. DR. S. SIROIS, Health Unit, Rivière-du-Loup.

A Water-Borne Typhoid Outbreak in St. Rédempteur, Quebec. DR. A. BELANGER, Health Unit, Lévis.

The Confidential Medical Certificate of Death. DR. PAUL PARROT, Demographer, Ministry of Health, Quebec.

A Study on Natality in Quebec. DR. L. PELLETIER, Health Unit, St. Anselme, Quebec.

The Fallacy of Counting Births and Deaths according to Place of Occurrence instead of Place of Residence. DR. E. GAGNON, Assistant Director and Demographer, Department of Health, Montreal, Quebec.

A Series of Generalized Smallpox Vaccinations. DR. P. CLAVEAU, Immigration Hospital, Quebec. Presented by DR. LEO LYNCH, Health Unit, Cookshire.

A Study of Cerebro-spinal Meningitis. DR. J. DUPLESSIS, Department of Health, Montreal, Quebec.

MONDAY, JUNE 9th, 10.00 A.M.

SANITARY INSPECTORS' SECTION

Chairman: MR. THEO. J. LAFRENIERE, C.E., Chief Engineer, Ministry of Health of Quebec, Montreal.

Nuisances and How to Deal with Them. DR. J. DEVARENNES, Quebec.

Improvements in School Buildings. MR. CHARLES MOREAU, Health Unit, St. Anselme, Quebec.

Sanitation in Mines. Mr. S. Plamondon, C.E., S.I., Health Unit, Amos, Quebec.
Canning Food Products. Dr. E. Couillard, Quebec.
Healthfulness of Carbonated Beverages. Mr. L. Fontaine, C.E., S.I., City Health Unit, Trois Rivières, Quebec.

MONDAY, JUNE 9th, 10.00 A.M.

SECTION OF PUBLIC HEALTH NURSING

Chairman: Miss Elizabeth A. Russell, Director of Public Health Nursing, Department of Health and Public Welfare of Manitoba.

The Prenatal Visit. Miss Marcelle Power, Health Unit, Lévis, Quebec.
The Postnatal Visit. Mrs. B. Blais, Health Unit, Rivière-du-Loup, Quebec.
The Baby Clinic. Miss Flore Lesage, Health Unit, Plessisville, Quebec.
The Health of the Preschool Child. Miss Juliette Tétreau, Health Unit, St. Hyacinthe, Quebec.
Health Teaching in the School. Miss Adrienne Gregoire, Health Unit, Beauceville, Quebec.
Control of Communicable Diseases. Miss Lilian Harrison, Health Unit, Lachute, Quebec.
The Activities of "L'Assistance Maternelle". Miss Alice Lepine, Director, "L'Assistance Maternelle", Montreal.
Dental Hygiene in Trois Rivières. Miss Beatrice Charron, Health Unit, Trois Rivières, Quebec.
Planning One's Work. Miss Lucie Robichaud, Health Unit, Ste. Anne de la Pocatière, Quebec.
Team Work in School Health. Miss Mary Ritchie, Department of Health, Montreal, Quebec.

MONDAY, JUNE 9th, 10.00 A.M.

TRAVELLING CHEST CLINICIANS OF THE PROVINCE

Business Meeting

MONDAY, JUNE 9th, 11.00 A.M.

TUBERCULOSIS SECTION

Chairman: Dr. J. A. Couillard, Superintendent, St. George Sanatorium, Mont Joli and Technical Adviser to the Division of Tuberculosis, Ministry of Health.

A Study of Tuberculosis Mortality in the Province of Quebec, 1935-1939. Dr. Lasalle Laberge, Ministry of Health, Province of Quebec.
Contacts and Early Diagnosis. Dr. Gerard Michaud, Roberval Sanatorium, and Dr. J. A. Chabot, Health Unit, Roberval, Quebec.
Asbestos Mines and the Workers Most Exposed to Asbestosis. Dr. Alex. Sirois, Thetford Mines, Quebec.
The Quebec Gold Mines and Tuberculosis Prevention. Dr. Jean L. Moreau, Rouyn, Quebec.

MONDAY, JUNE 9th, 12.30 P.M.

LUNCHEON

EXECUTIVE COUNCIL, CANADIAN PUBLIC HEALTH ASSOCIATION

Chairman: Dr. J. T. Phair, Chief Medical Officer of Health, Province of Ontario, and Honorary Secretary of the Association.

Business Meeting. Presentation of Reports.

LUNCHEON, 12.30 P.M.

PUBLIC HEALTH NURSES

Chairman: Mrs. B. Blais, Health Unit, Rivière-du-Loup.

Speaker: Miss Marguerite Taschereau, Local Supervisor, Metropolitan Life Insurance Company, Quebec, and Vice-Chairman of the Public Health Nursing Section, Canadian Public Health Association.

LUNCHEON, 12.30 P.M.

TUBERCULOSIS SECTION

Chairman: Dr. Lasalle Laberge, Director, Division of Tuberculosis, Ministry of Health, Province of Quebec.

Address: **Evolution of the Knowledge of Tuberculosis through the Ages.** Dr. J. A. Couillard, St. George Sanatorium, Mont Joli, Quebec.

MONDAY, JUNE 9th, 2.30 P.M.

FIRST GENERAL SESSION

Chairman: The Hon. M. H. Groulx, Minister of Health, Province of Quebec.

Address of Welcome. His Worship the Mayor of the City of Quebec.

Address. His Excellency Major-General Sir Eugene Fiset, Kt., C.M.G., D.S.O., V.D., LL.D., M.D., Lieutenant-Governor of the Province of Quebec.

Presidential Address. Dr. Jean Gregoire, Deputy Minister, Ministry of Health, Province of Quebec, and the President of the Canadian Public Health Association.

Adaptation of the Venereal Disease Control Program to National Defense. Dr. A. R. Vonderlehr, Assistant Surgeon General, Division of Venereal Diseases, United States Public Health Service, Washington, D.C.

The Development of a Municipal Sanitary Organization and the Provision of Health Districts in the City of Montreal. Dr. Adelard Groulx, Director, Department of Health, Montreal.

Children of Preschool Age. Dr. Ernest Couture, Chief, Division of Child and Maternal Hygiene, Department of Pensions and National Health, Ottawa.

Progress in Compulsory Pasteurization in Ontario. Dr. A. E. Berry, Director, Division of Sanitary Engineering, Department of Health of Ontario, Toronto.

MONDAY, JUNE 9th, 8.30 P.M.

SECOND MEETING OF THE PERSONNEL OF THE MINISTRY OF HEALTH

TUESDAY, JUNE 10th, 9.30 A.M.

EPIDEMIOLOGY AND VITAL STATISTICS

Chairman: DR. J. WYLLIE, Professor of Preventive Medicine, Queen's University Kingston, Ontario.

A Study on Scarlet Fever. DR. A. DALCOURT, Health Unit, Louiseville, Quebec.

Infant Mortality in Trois Rivières. DR. J. P. BEAUDET, Health Unit, Trois Rivières, Quebec.

Infant Mortality in Terrebonne County. DR. L. R. VEZINA, Ministry of Health, Province of Quebec.

Report on the Year's Activities in a Health Unit. DR. J. O. ROY, Health Unit, Victoriaville, Quebec.

Endemic Nasal Diphtheria in an Institution. DR. E. POTVIN, Health Unit, Chicoutimi, Quebec.

Half a Century of Diphtheria Prevalence in Quebec. DR. A. R. FOLEY, Epidemiologist, Ministry of Health, Province of Quebec.

Diphtheria Incidence in the City of Quebec. DR. BERCHMANS PAQUET, City Health Department, Quebec.

A Diphtheria Outbreak in a Protected Population. DR. A. CAUX, Health Unit, St. Flavien, Quebec.

Investigation on Marked Contamination of Milk by Thermoduric Bacteria in a Pasteurizing Plant. MR. D. GAUVIN amd MR. E. U. ALLARD, City Health Department, Quebec.

TUESDAY, JUNE 10th, 9.30 A.M.

PUBLIC HEALTH NURSING

Chairman: MISS ELIZABETH A. RUSSELL, Director of Public Health Nursing, Department of Health and Public Welfare of Manitoba.

The Home Visit. MISS LUCE TREMBLAY, Health Unit, Chicoutimi, Quebec.

Social Service and Tuberculosis Work. MISS JEANNE LAMOTHE, Health Unit, Trois Rivières, Quebec.

The Visiting Nurse and Her Role in Getting the Patient to Attend the Anti-Tuberculosis Clinic. MISS SIMONE LALIBERTE, Health Unit, Amos, Quebec.

Supervision of Cases and Contacts of Tuberculosis. MISS IVONNE RAYMOND, Quebec.

Selection of Patients for the Anti-Tuberculosis Clinic. DR. HERMAN GAUTHIER, St. George Sanatorium, Mont Joli, Quebec.

Presentation of Reports by Committees of the Public Health Nursing Section:

1. **Report of the Study Committee.** MISS MARY S. MATHEWSON, School of Nursing, McGill University, Montreal.

2. **Report of the Committee on Minimum Qualifications for Employment in Public Health Nursing.** Miss Elsie Hickey, Director of Public Health Nursing, City of Toronto.
3. **Report of the Committee on Supervision.** Miss Marion Nash, Victorian Order of Nurses, Montreal.

Discussion opened by Miss Eleanor Wheler, School of Hygiene, University of Toronto.

A Decade of Mental Health Work. Miss B. Laliberte, Department of Health, Montreal, Quebec.

The Visiting Nurse in a Sanitary District. Miss Rolande Pilon, Department of Health, Montreal, Quebec.

Outline of a Staff Education Program in a Visiting Nurse Service. Miss Annonciade Martineau, Department of Health, Montreal, Quebec.

TUESDAY, JUNE 10th, 9.30 A.M.

SANITARY INSPECTORS

Chairman: Mr. Theo. J. Lafreniere, C.E., Chief Engineer, Ministry of Health, Montreal.

Dairy Farm Inspection. P. Archambault, D.V.S., Health Unit, Richmond, Quebec.

Le commerce du Lait. E. C. Labelle, D.V.S., Health Unit, Rivière-du-Loup, Quebec.

Chronic Contagious Mastitis of Milk Cows. J. J. Bigras, D.V.S., Health Unit, Victoriaville, Quebec.

Food Inspection. M. Clairmont, D.V.S., Health Unit, St. Jean, Quebec.

Technique of Pasteurization. Mr. E. Langevin, C.E., Ministry of Health of Quebec, Montreal.

Study on the Consumption of Raw Milk. H. A. Rajotte, D.V.S., Health Unit, Sorel, Quebec.

Consumption of Milk Products in Louiseville. M. L'Hereux, D.V.S., Health Unit, Louiseville, Quebec.

TUESDAY, JUNE 10th, 9.30 A.M.

TUBERCULOSIS SECTION

Chairman: Dr. J. A. Couillard, St. George Sanatorium, Mont Joli, Quebec.

Tuberculosis and Infection in Large Families. Dr. Armand Beauchesne, Beauceville, Quebec.

Detection of Cancer and Heart Disease through Tuberculosis Clinics. Dr. Omer Manseau, Montreal, Quebec.

Detection and Elimination of Tuberculosis among School Teachers in the City of Quebec. Dr. Georges Gregoire, Provincial Committee for the Prevention of Tuberculosis, Quebec.

Hospitalization of the Tuberculous. Dr. J. A. Couillard, St. George Sanatorium, Mont Joli, Quebec.

TUESDAY, JUNE 10th, 9.30 A.M.

PUBLIC HEALTH EDUCATION

(Nutrition Program)

Chairman: DR. STEWART MURRAY, Senior Medical Health Officer, Metropolitan Health Committee, Vancouver, B.C.

The Survival of Twins born in 1939. DR. J. ERNEST SYLVESTRE, Ministry of Health of Quebec.

Nutrition and Dietetics in Schools and Eleemosynary Institutions. MISS JEANNINE CHAMPOUX, Ministry of Health of Quebec.

Nutrition and School Children. MISS FLORENCE ST. LOUIS, Ministry of Health of Quebec.

The Teaching of Nutrition and Hygiene to Specified Groups. DR. E. FRENETTE, Medical Officer, Grand'Mère, Quebec.

Teaching Nutrition to the Mother through the Well-baby Clinics. DR. E. MONDOR, Medical Officer, Buckingham, Quebec.

Teaching Nutrition to the Families through Home Visits. MISS VICTORINE LAROSE, Health Unit, Lachute, Quebec.

Nutrition in Nicolet. DR. JEAN PAQUIN, Medical Officer, Nicolet, Que.

TUESDAY, JUNE 10th, 12.30 P.M.

GENERAL LUNCHEON

Chairman: DR. JEAN GREGOIRE.

Speakers

DR. J. J. MCCANN, Member of Parliament, and Medical Officer of Health for Renfrew, Ontario.

EMILE VAILLANCOURT, Litt.D., F.R.G.S., Secretary, Quebec Branch, The Health League of Canada.

TUESDAY, JUNE 10th, 1.45 P.M.

Trip to Lévis County Health Unit, where a maternal hygiene demonstration and a tuberculosis clinic will be held concurrently.

SECOND GENERAL SESSION (2.30 P.M.)

Chairman: DR. JEAN GREGOIRE.

Morbidity Study in Municipal Doctor Areas in Rural Manitoba. DR. F. W. JACKSON, Deputy Minister of Health and Public Welfare, Province of Manitoba.

Nutritional Conditions in Quebec. DR. J. E. SYLVESTRE, Director, Division of Nutrition, Ministry of Health, Province of Quebec.

The Principal Dietary Deficiencies in Canada. DR. E. W. MCHENRY, School of Hygiene, University of Toronto; Chairman, Committee on Dietary Surveys, Canadian Council on Nutrition.

A Consideration of the B Group of Vitamins in Relation to National Health. DR. F. F. TISDALL, Hospital for Sick Children, Toronto; Chairman, Committee on Nutrition, Canadian Medical Association.

TUESDAY, JUNE 10th, 7.30 P.M.

ANNUAL DINNER

Chairman: DR. JEAN GREGOIRE, Deputy Minister, Ministry of Health, Province of Quebec, and President of the Canadian Public Health Association.

Greetings from the Honourable HENRI GROULX, Minister of Health and Public Welfare, Province of Quebec; Honourable ADELARD GODBOUT, Prime Minister of the Province of Quebec; DR. JOHN A. FERRELL, Director, International Health Division, The Rockefeller Foundation, New York City; Honourable MAURICE DUPLESSIS, Leader of the Opposition, Quebec; DR. W. S. LEATHERS, President of the American Public Health Association; and from DR. R. E. WODEHOUSE, Deputy Minister of Pensions and National Health.

Dancing.

WEDNESDAY, JUNE 11th, 9.30 A.M.

TUBERCULOSIS SECTION

This meeting will be a joint session with *La Société de Phtisiologie* and will be held at Laval Hospital.

Chairman: DR. ROLAND DESMEULES, Medical Director, Laval Hospital and President of "La Société de Phtisiologie", Quebec.

The Tuberculin Test in a Classical College. DR. JULES FONTAINE, Quebec.
The Tuberculin Test in an Orphanage. DR. GERARD TREMBLAY, Chicoutimi, Quebec.
The Value of Serodiagnosis in Tuberculosis. DR. MAURICE GIROUX, Laval Hospital, Quebec.
The Risk of Exposure to Tuberculosis for a Married Contact. DRS. ROLAND DESMEULES, LOUIS ROUSSEAU and PHILIPPE RICHARD, Laval Hospital, Quebec.
Progress in Tuberculosis Control in Canada. DR. G. J. WHERRETT, Canadian Tuberculosis Association, Ottawa.
Statistical Data on Thoracoplasty. DRS. PAUL ROGER and J. M. LEMIEUX, Laval Hospital, Quebec.

WEDNESDAY, JUNE 11th, 9.30 A.M.

SANITARY INSPECTORS

Chairman: MR. THEO. J. LAFRENIERE, C.E., Chief Engineer, Ministry of Health, Montreal.

Springs and Wells. MR. RENE CYR, C.E., Ministry of Health of Quebec, Montreal.
The Necessity of Provincial Plumbing Codes. MR. A. COUSINEAU, C.E., Sanitary Engineer, Department of Health, Montreal.
Comments on the Certificate in Sanitary Inspection. MR. C. A. BEAUBIEN, Eastview, Ontario.
Round-table discussion.

WEDNESDAY, JUNE 11th, 9.30 A.M.

INDUSTRIAL HYGIENE

Chairman: DR. CAMILLE SIMARD, Senior Medical Assistant, Workmen's Compensation Board, Quebec.

Fatigue in the Shoe Industry. DR. F. J. TOURANGEAU, Ministry of Health of Quebec.

Arsenic Estimation—New Modifications of the Gutzeit Method. MR. F. L. DESAULNIERS, C.E., Ministry of Health of Quebec.

Problems of Industrial Hygiene in the Province of Quebec. MR. A. ARCAND, Ministry of Health of Quebec.

Chronic Fatigue Symptoms in Industrial Employees. DR. R. VANCE WARD, Department of Public Health and Preventive Medicine, McGill University.

Industrial Hygiene in Relation to Aviation. DR. K. E. DOWD, Assistant Chief Medical Officer, Canadian National Railways, Montreal.

WEDNESDAY, JUNE 11th, 9.30 A.M.

SOCIAL HYGIENE

Chairman: DR. J. A. LAPIERRE, General Director of Services, Ministry of Health, Montreal.

Serological Reactions in the Diagnosis of Syphilis. DR. J. ARCHAMBAULT, Ministry of Health of Quebec, Montreal.

Some Aspects of the Control and Prevention of Venereal Diseases. DR. E. LALANDE, Ministry of Health of Quebec, Montreal.

Some Observations on Venereal-Disease Legislation. DR. G. CHOQUETTE, Ministry of Health of Quebec, Montreal.

Treatment of Neurosyphilis by Artificial Fever. DR. ALBERIC MARIN, University of Montreal.

Congenital Syphilis. DR. E. GAUMOND, Quebec.

A Neglected Aspect of Mental Hygiene. DR. C. A. GAUTHIER, Quebec.

Detection during Childhood of those Predisposed to Mental Illness. DR. J.-CHS. MILLER, Ecole La Jemmerais, Mastaï, Quebec.

WEDNESDAY, JUNE 11th, 9.30 A.M.

PUBLIC HEALTH EDUCATION

Chairman: DR. STEWART MURRAY, Senior Medical Health Officer, Metropolitan Health Committee, Vancouver, B.C.

Improving Nutrition via the Family Budget. MISS MARION HARLOW, Victorian Order of Nurses, Montreal.

The Nutritive Value of Canned Foods. MISS EVELINE LEBLANC, Department of Agriculture, Ottawa, Ontario.

Breast Feeding. DR. PAUL AUGER, Health Officer, New Carlisle, Quebec.

Dental Hygiene. DR. ERNEST CHARRON, Montreal.

Our Next Objective. DR. JULES GILBERT, Medical Officer, Granby, Quebec.

The Development of County Health Units in Quebec. DR. BRUNO LAHAYE, Director of County Health Units, Ministry of Health of Quebec.

Public Charities in Quebec. DR. A. BOSSINOTTE, Director of the Public Charities Bureau, Ministry of Health of Quebec.

WEDNESDAY, JUNE 11th, 1.00 P.M.

LUNCHEON

Chairman: Honourable HENRI GROULX, Minister of Health and Public Welfare, Quebec.

Presentation of the awards in the 1940 Canadian Health Conservation Contests, conducted by the Canadian Public Health Association in cooperation with the American Public Health Association.

THE RURAL CONTEST

Eastern Division: Terrebonne County Health Unit, St. Jerome, Quebec. St. Jean-Iberville-Laprairie-Napierville Health Unit, St. Jean, Quebec.
Western Division: Peace River Health Unit, Pouce Coupe, British Columbia. St. James-St. Vital Health Unit, Manitoba.

THE CITY CONTEST

Group 1. Cities over 100,000 population with full-time services: Windsor, Ontario. Hamilton, Ontario.
Group 2. Cities under 100,000 with a full-time medical officer: Saint John, New Brunswick. London, Ontario.
Group 3. Cities under 100,000 with a part-time medical officer: St. Catharines, Ontario.

WEDNESDAY, JUNE 11th, 2.00 P.M.

THIRD GENERAL SESSION

Chairman: DR. JEAN GREGOIRE.

Public Health in Wartime. DR. GRANT FLEMING, Medical Director, The Bell Telephone Company, Montreal; Strathcona Professor of Public Health and Preventive Medicine, McGill University.
Industrial Hygiene. DR. J. G. CUNNINGHAM, Director, Division of Industrial Hygiene, Department of Health of Ontario, Toronto.
Venereal-Disease Control. DR. GORDON BATES, General Director, The Health League of Canada, Toronto.
Mental Diseases. Speaker to be announced.
Communicable Disease Control. DR. D. T. FRASER, Connaught Laboratories and School of Hygiene, University of Toronto.
The State of the Health of the Recruit before Enlistment. COLONEL JULES MERCIER, District Medical Officer, District No. 4, Quebec.

WEDNESDAY, JUNE 11th, 2.00 P.M.

BUSINESS MEETING OF THE NURSES OF THE MINISTRY OF HEALTH

ONTARIO HEALTH OFFICERS ASSOCIATION

ANNUAL CONFERENCE

1941

Joint Meeting with the

CANADIAN INSTITUTE OF SANITARY INSPECTORS
(Ontario Branch)

Royal York Hotel, TORONTO, May 22-23, 1941

(Daylight Saving Time)

THURSDAY, MAY 22

9.00 a.m. **Executive Meeting.** Secretary's Room.
9.00 a.m. **Registration.**
9.00 a.m. **Showing of Films.**
10.15 a.m. **General Session.** Crystal Ball Room.

Review of Legislation as passed at the 1941 Session of the Legislature:

Interpretation of the Legislation in General Terms. DR. B. T. MCGHIE, Deputy Minister of Health.
ALAN VAN EVERY, Solicitor to the Department of Municipal Affairs.

Specific Legislation and its Application by the Local Community. DIRECTORS OF THE DIVISIONS, Ontario Department of Health.

11.30 a.m. **Appointment of Committees:**
Committee on Resolutions.
Committee on Nominations.

Section Meetings

SECTION: **VETERINARIANS SECTION**

Hall "A"

9.00 a.m. **Registration.**
10.15 a.m. **General Session.** Crystal Ball Room.

SECTION: **CANADIAN INSTITUTE OF SANITARY INSPECTORS (Ontario Branch)**

Hall "B"

10.00 a.m. **Registration.**
Conference opened.
Chairman: D. S. MCKEE, C.S.I.(C.), President, Ontario Branch, Canadian Institute of Sanitary Inspectors

(a) **Housing and Sanitary Control in Rural and Small Urban Communities.** HUGH MCINTYRE, A.R.San.I., Provincial Sanitary Inspector, Kirkland Lake.

(b) **The Role of the Sanitary Inspector in a Modern City Health Service.** E. J. PICTON, C.S.I.(C.), Sanitary Inspector, Hamilton.

(c) **Sanitization of Eating Utensils.** R. A. MACPHERSON, B.A., C.S.I.(C.), Sanitary Inspector, Peterborough.

Discussion.

Luncheon Meeting

Tudor Room

12.30 noon Luncheon Session. All Sections.

Address of Welcome. HAROLD J. KIRBY, K.C., Minister of Health for Ontario.

Address. GROUP CAPTAIN R. W. RYAN, Director, Medical Services, Royal Canadian Air Force.

THURSDAY, MAY 22
(Afternoon Session)

Crystal Ball Room

2.15 p.m. Presidential Address. DR. F. A. LADOUCEUR.

2.30 p.m. Symposium: "Public Health in Wartime."

1. **Communicable Disease Control.** DR. JOHN T. PHAIR, Chief Medical Officer of Health.
2. **Special Measures with regard to Cerebro-Spinal Meningitis.** DR. NELLES SILVERTHORNE, Research and Clinical Associate, Connaught Laboratories.
3. **The Physician's Contribution to Industrial Health in Wartime.** DR. J. GRANT CUNNINGHAM, Director Division of Industrial Hygiene, Ontario Department of Health.
4. **Civilian Defence.** DR. W. L. HUTTON, Medical Officer of Health, Brantford.

Showing of Film: "London Can Take It."

4.00 p.m. Committee on Resolutions will meet in the room of the President.

FRIDAY, MAY 23
(Morning Session)

Section Meetings

SECTION: **MEDICAL OFFICERS OF HEALTH FROM COMMUNITIES OF POPULATION 4,000 AND OVER**

Hall "D"

Chairman: DR. H. B. KENNER, Medical Officer of Health, Stratford

9.30 a.m. Administrative Procedures in Problems of Sanitation. DR. A. E. BERRY, Director Division of Sanitary Engineering, Ontario Department of Health.

Value of the Annual Report. DR. J. EDGAR DAVEY, Medical Officer of Health, Hamilton.

The Health Program in the High School. DR. D. V. CURREY, Medical Officer of Health, St. Catharines.

Whose is the Responsibility for Following Up the Venereal Disease Contact? DR. W. H. AVERY, Director Division of Venereal Disease Control, Ontario Department of Health.

The Urban Centre and Suburban Areas: Responsibility for Child Health Services. DR. C. A. HARRIS, Medical Officer of Health, London.

Question Box.

SECTION: **MEDICAL OFFICERS OF HEALTH FROM COMMUNITIES OF POPULATION 4,000 OR LESS**

Crystal Ball Room

Chairman: DR. F. A. LADOUCEUR, Medical Officer of Health, Casselman

9.30 a.m. **Assistance Available to the Medical Officer of Health for his Local Dental Health Program:**

What the Ontario Dental Association Offers. DR. A. E. HIGGINS, Secretary.

What the Department of Health of Ontario Contributes. DR. H. J. HODGINS, Director, Dental Services.

Immunization against Scarlet Fever. DR. L. J. SUTHERLAND, Medical Officer of Health, Owen Sound.

The Relationship of the Medical Officer of Health to the Local Board of Health. DR. J. HOWARD MUNRO, Chairman, County Board of Health, Maxville, Ont.

Standards for Tourist Accommodation. G. A. H. BURN, B.A.Sc., Division of Sanitary Engineering, Ontario Department of Health.

Administrative Procedures in Problems of Rural Sanitation. DR. A. E. BERRY, Director, Division of Sanitary Engineering, Ontario Department of Health.

Question Box.

SECTION: **CANADIAN INSTITUTE OF SANITARY INSPECTORS (Ontario Branch)**

Hall "B"

Chairman: D. S. MCKEE, C.S.I.(C.)

9.00 a.m. (a) **Restaurant Inspection.** A. G. MACNAB, C.S.I.(C.), Westmount, P.Q.

(b) **Instruction and Supervision of Food Handlers: What Shall We Tell Them?** GORDON MILLER, C.S.I.(C.), Chief Sanitary Inspector, Windsor.

(c) **Field Work re Typhoid Fever Control and Follow-up of Typhoid Carriers in Unorganized Districts.** D. E. MOORE, C.S.I.(C.), Provincial Sanitary Inspector, Kenora.

Discussion.

SECTION: **VETERINARIANS' SECTION**

Hall "A"

Chairman: DR. H. J. DAVIS, Aylmer

9.00 a.m. 1. **Paratyphoid Infections of Animals Transmissible to Man.** A. R. YOUNIE, Food and Milk Inspector, St. Catharines.

2. **Mastitic Infection as it Affects the Milk Supply.** C. K. MADER, Department of Food Control, Kitchener.

3. **Viability of Pathogens in Dairy Products.** W. G. STEVENSON, Ontario Agricultural College, Guelph.

4. **Handling of Fish.** F. W. FLEMING, Central Laboratories, Ontario Department of Health.

5. **Effect of Temperature on Storage of Foods.** H. J. DAVIS, Aylmer.
6. **The Need for Meat Inspection in Rural Districts.** W. A. GILL, Division of Food Sanitation, London.

LUNCHEON SESSION (All Sections)

Tudor Room

12.30 noon **Business Meeting of the Ontario Health Officers Association.**
Presiding: DR. F. A. LADOUCEUR.
Tribute to Members deceased since 1940 Conference.
Reception of Reports:
Committee on Resolutions.
Committee on Accident Prevention.
Committee on Nominations.
Election of Officers.

FRIDAY, MAY 23
(Afternoon Session)

Crystal Ball Room

2.15 p.m. **Influenza.** DR. RONALD HARE, Research and Clinical Associate, Connaught Laboratories, University of Toronto.
Value of Tuberculin Testing and X-Raying of Positive Reactors in Certain Groups of the Population. DR. L. A. PEQUEGNAT, Deputy Medical Officer of Health, Toronto.
Psittacosis. DR. A. L. MACNABB, Director of Laboratories, Ontario Department of Health.
Trichiniasis—Report of a Recent Outbreak: Parasitology—Symptomatology—Pathology—and Control. W. J. DEADMAN, Director of Laboratories, Hamilton.

Section Meeting

SECTION: **CANADIAN INSTITUTE OF SANITARY INSPECTORS (Ontario Branch)**

Hall "B"

2.15 p.m. **Annual Meeting and Election of Officers.**